REPORT RESUMES

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A COMPARISON OF ESPECIALLY DESIGNED ART ACTIVITIES WITH TRADITIONAL ART ACTIVITIES AS USED WITH INTELLECTUALLY HANDICAPPED CHILDREN AND YOUTH.

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A STUDY WAS MADE TO DETERMINE WHETHER MENTALLY RETARDED CHILDREN PREFER SPECIFICALLY DESIGNED ART ACTIVITIES TO THE MORE TRADITIONAL ONES, AND TO TEST THE EFFECTS ON CENTRAL MOTOR SKILLS, ACADEMIC ACHIEVEMENT, ART, AND SOCIAL BEHAVIOR. ELEMENTARY, JUNIOR HIGH, AND SENIOR HIGH STUDENTS IN SPECIAL CLASSES WERE DIVIDED INTO TWO GROUPS. NEW ART PROGRAMS WERE INITIATED IN EXPERIMENTAL CLASSES AND TRADITIONAL PROGRAMS WERE CONDUCTED IN SIX CONTROL CLASSES. ANECDOTAL RECORDS OF BEHAVIORAL REACTIONS, INDEPENDENT JUDGMENTS OF THE ART PRODUCTS, PREFERENCE QUESTIONNAIRES, GRADES IN ALL SUBJECTS, TEST RESULTS FROM MENTAL MATURITY AND ACHIEVEMENT TESTS, TEACHER EVALUATIONS OF STUDENT GROWTH, BEHAVIOR, AND INTEREST, AND OTHER MEASURES PROVIDED DATA FOR COMPARING THE EXPERIMENTAL AND CONTROL GROUPS. THE GENERAL PATTERN DERIVED FROM THE DATA INDICATES THAT THE EXPERIMENTAL PROGRAM IS CONSISTENTLY MORE EFFECTIVE IN ALTERING CHARACTERISTICS OF BEHAVIOR WITH THE YOUNGER CHILDREN. THE TREND IS NOTED FOR ACADEMIC ACHIEVEMENT, MOTOR SKILLS, AND MEASURES OF SOCIAL BEHAVIOR. THE SAME PATTERN IS ALSO REFLECTED IN THE MEASURES RELATED TO ASPECTS OF ART BEHAVIOR. AS EVIDENCED BY A LESSER DEGREE OF DIFFERENTIATION AT THE SECONDARY LEVEL, THERE SEEMS TO BE A RANGE OF DEVELOPMENT BEYOND WHICH ALTERATION OR A SHIFT IN EMPHASIS HAS MINIMAL EFFECT. IN FACT, AN ATTEMPT TO ALTER BASIC PATTERNS OF PERFORMANCE AT THIS LEVEL SEEMS TO HAVE A DISTURBING EFFECT AND MAY RESULT IN A SUSPENSION OF THE GROWTH CURVE. WHILE THIS PROJECT DID NOT EXTEND LONG ENOUGH TO FURTHER EXPLORE THIS OCCURRENCE, IT WOULD SEEM LIKELY THAT THIS WOULD BE OF A TEMPORARY NATURE PROVIDED CONSISTENCY EXISTS WITHIN THE PROGRAM. (GC)

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A Comparison of Especially Designed Art Activities with Traditional Art Activities as Used with Intellectually Handicapped Children and Youth

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A COMPARISON OF ESPECIALLY DESIGNED ART ACTIVITIES WITH TRADITIONAL ART ACTIVITIES AS USED WITH INTELLECTUALLY HANDICAPPED CHILDREN AND YOUTH

CHAPTER I

INTRODUCTION

The need to develop and maintain the creative interest of intellectually handicapped children has been widely recognized. Various art forms provide excellent media for creative activities. In the past art activities for intellectually handicapped children and youth have been taken almost directly from the art curriculum for pre-school and primary grades. It seems possible that creative activity among retarded children can be increased if the art program is especially adapted for these children.

With time a limiting factor in the education of the retarded pupil, it is important that instruction in all areas be effective and efficient. A curriculum which includes developmental art skills may be a means of providing these pupils with wholesome and meaningful experiences. Every such experience through which learning is achieved, brings the pupil forward a step toward attaining his potential. The concern of the educator is not focused on the art ability of the individual. Of greater value is giving the pupil a socially acceptable way to express his personal reactions.

PILOT STUDY [2, 20]

Because of the lack of research data in the area of art for the intellectually handicapped, a two-year pilot study was launched in Arlington, Virginia, in 1957 and completed in June, 1959. Undertaken by several art teachers and two classroom teachers the study was designed to:

1. reveal a preferred listing of successful art activities and teaching procedures for use with mentally retarded and slow-learning children in grades 1-12,
2. discover, if possible, the factors shared in common by these activities and procedures.

The participants believed they could better design an improved curriculum based upon the common factors revealed by the study. This was an additional attempt to establish that the design would be successful before the new curriculum was put into operation.

The research team took the following steps:

Compiled a list of art activities and procedures found to be popular with mentally retarded and slow-learning Arlington high school age children.

Analyzed these activities and identified the common characteristics possessed by some or all of the activities and procedures.

Noted the presence of 9 conditions which might account for the relative popularity of each activity:

1. **Material had a definite weight.**
2. **Material was permanent, solid, hard.**
3. **Manual art tools were used.**
4. **Product was in "relief".**
5. **Finished product was shown; steps for completion were outlined singly.**
6. **Art object had been produced from an acceptable raw material which had monetary value.**
7. **Sensory reactions were strong.**
8. **Product was designed as a gift.**
9. **Daily product growth was visible.**

Compiled a list of art activities and procedures found to be popular with mentally retarded and slow-learning children of primary grade age.

Compiled a list of art activities and procedures found to be popular with mentally retarded and slow-learning children of intermediate grade level.

Analyzed these activities and noted the common factors possessed by some or all of the activities and procedures.

From the pilot study, the following observations were made:

1. **An intellectually handicapped child's definition of reality seems to be built around a physical reality which has permanence, solidity and three-dimensional depth.**

2. **Objects seem most real to the intellectually handicapped child when they evoke strong tactile reactions and involve large muscle activity of a strenuous nature.**

3. **The intellectually handicapped child's definition of reality is further delineated and conditioned by the attitudes and preferences of his peers.**

4. **From the intellectually handicapped child's point of view, the intended use of the object is as a gift.**

5. Tools are oriented toward the interests and maturity of the intellectually handicapped child.

6. Improved results with intellectually handicapped children are noted when attention is given to the following aspects of the instructional situation:

    a. Classroom setting
    b. Choice of project
    c. Lesson motivation
    d. Adaptation of materials and techniques
    e. Purposeful evaluation

7. There appears to be a relation between the concrete, sensory experiences of an intellectually handicapped pupil and his art production.

PURPOSE OF THE STUDY

On the basis of the tentative findings and the additional questions suggested by the examination of the data from the Pilot Study, a further intensive and broader project was undertaken.

Specifically this study proposes to:

1. Test whether or not the experimental art program will modify significantly the general motor skills, academic achievement and social behavior of intellectually handicapped pupils.

2. Test whether or not the experimental art program will modify significantly selected areas of art behavior in intellectually handicapped pupils.

3. Identify the preferences for certain art activities and teaching procedures.

HYPOTHESES

The hypotheses to be tested are:

I. The experimental art program is significantly related to the development of intellectually handicapped children in selected areas.

- A. General motor skills
- B. Academic achievement
- C. Social behavior

II. The experimental art program is significantly related to the development of intellectually handicapped pupils in selected areas of art behavior.

QUESTIONS

In order to facilitate the examination and interpretation of the statistical analyses of the various sections of these hypotheses, the following specific questions have been developed.

1. Does the experimental program in art affect the academic progress of pupils as measured by the CALIFORNIA ACHIEVEMENT TEST?
2. Is there a relationship between the experimental program in art and motor coordination as determined by the MOTOR COORDINATION APPRAISAL?
3. Do differences exist between experimental and control groups in general behavior as measured by the PROPOSED RATING SCHEDULE FOR CLASSES OF EXCEPTIONAL CHILDREN?
4. Do differences exist between the experimental and control groups in art behavior as measured by the ART BEHAVIOR RATING SCALE?
5. Does the pupils' interest in art become affected by the experimental art program as measured by the ART INTEREST INVENTORY?
6. Is the creativity of pupils in art affected by the experimental program as measured by the WARTEGG TEST?
7. Does the experimental program in art increase the level of sophistication in design judgment as measured by the GRAVES DESIGN JUDGMENT TEST?
8. Do differences exist in the art performance of pupils in the experimental and control groups as determined by a comparison of ART SAMPLES?
9. What characteristics are present in the art activities preferred by the pupils as measured by the ART EVALUATION CONFERENCE?

DEFINITION OF TERMS

For the purpose of this study the following definitions of terms are employed.

1. Educable Mentally Retarded -- School age pupils having I.Q.'s within the range of 50 - 75 as measured by an individual psychological examination.

2. Slow Learner -- School age pupils having I.Q.'s within the range of 75-90 as measured by an individual psychological examination.

3. Intellectually Handicapped -- Includes individuals in both educable mentally retarded and slow learning groups.

4. Experimental Group -- The group of pupils using the experimental materials and methods.

5. Control Group -- The group following the typical art program in elementary schools in Arlington County.

6. Academic Achievement -- Level of performance in the skill subjects as measured by the California Achievement Test.

7. Curriculum -- The total pattern of instructional materials and methods used to accomplish the educational objectives.

8. Helping Teacher in Art -- A teaching specialist who conducts demonstration lessons on a scheduled basis. She assists the classroom teacher in long range planning and the improvement of teaching methods.

9. Resist Material-- A material offering resistance when manipulated by hand or tools.

LIMITATIONS OF THE STUDY

Evaluation of the findings of this study is limited by the relatively short duration of the period covered by the project. There was also a limited utilization of art opportunities provided by the project. For example, only at the secondary level were pupils attending art classes daily. At the primary and intermediate levels, the pupils worked with the art specialist two times each month.

Since the design of the project involved twelve separate classrooms, the degree of the effect of teacher personality on the findings was difficult to assess.

While the sample size for various sub-groups, i.e. primary, intermediate and secondary is relatively small, appropriate small sample statistics are used in the analysis of the data.

RELATED RESEARCH

In attacking the problems inherent in the development of an art program for intellectually handicapped children, it is important to know the extent to which it is possible to predict the suitability of various activities and teaching procedures. However, little is available in this field relative to student needs, interests, activities and resultant teaching procedures.

The paucity of systematic study in this area was revealed by the fact that in 1950, the Encyclopedia of Educational Research quoted only 81 studies in all phases of art education, and listed none in the area for the mentally retarded.

In reviewing the literature, only one study was found which constituted a systematic attack on problems of developing and evaluating a series of art activities and teaching procedures for mentally retarded children[10]. This study was directed toward an effort to measure changes in behavior in 35 mentally retarded children who were subjected to an experimental art program using resist materials for a two week period. Results indicated that the experimental group had made a gain in adjustment which could only happen by chance in 5 cases out of one hundred, whereas the control group gain could have happened by chance in 40% of similar cases.

A recent report by Tobias and Gorelick[18] presented the utility of the Goodenough Draw-a-Man Test in the appraisal of retarded adults. Seventy-five retarded, non-institutionalized young adults were evaluated on the Goodenough Scale and WAIS Scores. It was found that the scores of paired drawings separated by a period ranging from six to forty-two months "demonstrated extremely high instruments". In correlating the results of the psychological testing with the Goodenough Scale, it seemed to the investigators that retarded adults had reached their maximum level of development.

To evaluate the vocational potential of mentally retarded young adults, Tobias and Gorelick devised a series of tests, given at the time the trainees entered the sheltered workshop. A similar correlation between the Goodenough Scores and the Evaluation Test Scores was found (.401) at the level of significance. The correlation between the WAIS Performance Scores and the Evaluation Test Scores was found higher (r.63 at the .01 level of significance). The correlation between the WAIS Verbal Scores and the Evaluation Test was found to be higher but failed to reach significance at the .05 level. The Goodenough Scores predicted work efficiently similar to the WAIS Full Scale; however, the WAIS Performance Scores predicted better efficiency in a workshop setting.

Schaefer-Simmern[16] provided a description of methods of teaching recommended for use with the mentally retarded. He described a proposed sequence of art activities for "mental defectives" and indicated certain

recommended practices and procedures. However, no formal testing procedures, experimental - control group techniques or other common evaluative devices were mentioned. His conclusions concerning teaching procedures were based upon small and heterogeneous samplings ranging in age from eleven to fifteen years.

The emphasis of current research in art continues the trend of Goodenough[6] who found that drawings made by subnormal children resemble those of younger children in their lack of detail and defective sense of proportion. The analysis of art production as an assessment of maturity, achievement, intelligence or artistic aptitude has occupied the interest of investigators in this area.

With the vocational objectives becoming more predominant in the education of the mentally retarded, certain studies concerning vocational rehabilitation may make contributions to the field of art education. A review of the rehabilitation literature indicates the recognition of a great need for adequate school programs, occupational centers and trade school training.

A recent report by Riedel[14] stressed the importance of art education for mentally retarded children at all levels. His own experiences with mentally retarded adolescents and adults are summarized in six principles:

1. **Tactual and kinesthetic experiences need to be better developed.**
2. **Attainment of independence by doing is a most valuable factor.**
3. **Art education should not be a compensation for failure in verbal performance, but should be evaluated in terms of total growth.**
4. **Artistic activities stimulate thinking and speaking, enrich the vocabulary and develop self-confidence.**
5. **Art Centers, occupational training centers and sheltered workshops should not be for mending furniture only.**
6. **Exhibitions of art projects made by mentally retarded youngsters help them to gain friends and promote art education.**

In a recent book, Chapman[3] stressed the fact that a handicapped person needs a friend rather than a supervisor. Therapeutic effectiveness can be obtained by mutual responses to suggestions and activities. Chapman presented suggestions for planning activities. He recommended 8 three-dimensional activities as particularly helpful for a well balanced program: modeling, papercraft, puppet making, sewing, weaving, woodworking, ceramics and rug weaving. Projects such as basketry and knitting require special qualified direction. He put much emphasis on the use of scrap materials including used Christmas cards, leather pieces, ribbon seconds, felt scraps, native clays, X-ray sheets, lumber pieces, and newspaper. He expressed his point of view as follows: "The productive use

of hands and the sense of satisfaction gained from newly created objects are some of the psychological advantages inherent in hand crafts. Products should be useful and beneficial to the handicapped."

Arje [1] described the fine arts as an adjunct to rehabilitation and stated that the arts can make a special contribution to the habilitation and rehabilitation of persons with physical, mental or emotional handicaps. "A handicapped person is not only cut off from relating to others by his limitations and disorders, but also his relation to himself is impaired. It is not the product which is important, but what takes place within the patient."

In 1955, Frederik M. Logan [11] reported in the Review of Educational Research that: "Art Education is at a point where relatively little scientific study is being given to the curriculum." In 1958, Jerome J. Hausman [7] summarized the current status of research in art education in the same journal, but again no mention was made of studies of art curricula designed for mentally retarded children.

A look at the studies concerned with curriculum for special classes reveals the continuous feeling that more emphasis should be placed on the development of motor skills. Wallin [19] stated that instruction in the arts should be an essential part of special class planning. Kirk and Johnson [9] stressed repeatedly that an art program should become an integral part of the curriculum. "The fine arts, correlated with other subjects in the curriculum, render an incalculable service in the clarifying of ides the children are attempting to visualize and to express...." The Illinois Curriculum Guide for Mentally Handicapped [8] emphasizes more social and economic usefulness through arts and crafts activities. "Activities such as clay modeling, printing, weaving, and simple projects with metal and wood can be utilized in varying degrees depending on the stage of the child's development."

Considering the paucity of available research and theoretical discussion of the role of art in the educational program for intellectually handicapped children, the current study is an attempt to help make a contribution toward methodology and measurement of outcomes in this curriculum area.

CHAPTER II

PROCEDURE

PROJECT POPULATION

The project population consisted of a group of intellectually handicapped pupils. The overall I.Q. range for this designation for pupils of this project was 50-90, as measured by the Wechsler Intelligence Scale for Children. A total of 165 educable mentally retarded and slow-learning pupils was included in the project. At the primary and intermediate levels the children were enrolled in self-contained special education classrooms. At the secondary level various modes of accommodation were utilized, including self-contained special classrooms and adapted scheduling, depending upon the specific characteristics of the school populations and their programs.

Table I gives the I.Q. range by class placement levels.

The chronological ages of children included in the study range from six years one month to eighteen years eight months (Table I).

The mental ages of children included in the study range from four years to thirteen years four months (Table I).

Socio-Economic Index

In the metropolitan area in which the schools of the project are located, there is an unbalanced distribution of individual social status. The occupations of the area tend to center about the services of the federal government. Most persons residing in the area are either employed by the government or are engaged in services intended to help maintain the homes of the workers. The teachers records assisted in providing the data necessary for completing the Socio-Economic Index[20]. This index is based upon education and occupation as symbols of social status. The frequency distributions for the experimental and control groups indicated a balance of distribution of socio-economic levels. By using classes in different schools equalization of socio-economic levels in the experimental and control groups and at the academic levels was maintained.

MEASURES USED

The following instruments were used to gather data pertinent to the project questions.

TABLE I

DESCRIPTIVE DATA ON SPECIAL CLASSES PARTICIPATING IN THE ART PROJECT

School	N	C. A. Range	I. Q. Range	M. A. Range
Secondary				
A	19	15-9 to 18-7	70 to 89	10-7 to 12-3
B	23	13-6 to 18-9	55 to 89	8-0 to 12-0
C	16	13-0 to 17-5	55 to 89	8-4 to 13-4
D	14	13-0 to 14-8	55 to 89	8-4 to 10-8
Intermediate				
E	15	11-0 to 14-0	55 to 89	7-8 to 10-8
F	15	9-0 to 12-6	55 to 89	5-2 to 9-1
G	8	9-9 to 12-4	55 to 89	6-0 to 9-7
H	10	10-2 to 12-8	55 to 89	6-9 to 9-4
Primary				
I	14	6-1 to 10-2	55 to 75	4-2 to 7-3
J	13	7-0 to 9-11	55 to 75	4-6 to 7-3
K	7	6-1 to 10-3	55 to 75	4-6 to 7-1
L	11	6-10 to 9-10	55 to 75	4-0 to 7-1
Total	165			

A copy of all non-standardized instruments designed for this study (Proposed Rating Schedule for Classes of Exceptional Children, Art Index, Art Interest Questionnaire, Pupil-Teacher Conference, Motor Coordination Appraisal, Parent Interview Questionnaire, Characteristics of Teaching Procedures, Art Behavior Rating Scale) will be found in Appendix D.

California Achievement Test

In order to measure the growth of pupils in the skill subjects, the California Achievement Test was administered in small groups to the project population. The form used was selected on the basis of approximate grade level for individual children in each group.

Proposed Rating Schedule for Classes of Exceptional Children*

To measure growth in classroom adjustment, use was made of the Proposed Rating Schedule for Classes of Exceptional Children, originated by Dr. E. Lakin Phillips[12]. This scale contains twenty-six items with each item rated on a 7-point scale varying from an extreme negative degree to the extreme positive degree in order to provide a comprehensive description of each pupil's classroom attitudes. The pre-evaluation was applied by the classroom teacher after the child had been in the classroom for one month. Post-evaluation took place at the end of the school year.

Graves Design Judgment Test

To test the ability of the pupils to judge design, the Graves Design Judgment Test was administered. This design test consists of ninety plates. In adapting it for use with the project, sixty plates were elected. Each plate contains either 2 or 3 simple designs for the subject to indicate the one most pleasing to him. At the primary and intermediate age levels, the test was administered on an individual basis from the test booklet. At the secondary level, the test was presented to the class with the projection of slides and an answer sheet on which to indicate a preference. Thirty plates were presented at each of the two test sessions which were held on consecutive days.

Wartegg Test

To test the level of creativity of the subjects in art, the Wartegg Test was administered by the art teachers. The pre-test was given to the project population after two lessons of the class and the post-test was completed as a final class activity. This test evaluates the degree of creativity evidenced by the subject when he completes 8 unfinished abstract drawings.

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* In reporting the data, the CLASSROOM BEHAVIOR SCALE will be used to identify this instrument. The ten categories which related most to the areas being investigated in this study were used in this research.

Art Sample Index

Each child in the project was asked to complete a 2 dimensional drawing using crayon on 9" x 12" manila or white paper. It was to contain a person, a tree and a house in any composition conceived by the subject. This was the first art activity of the year for each class. This sample of art work was evaluated by five experienced art educators who placed the drawings on a progressive scale obtained from general school population in Kindergarten through Grade 8 of the same system from which the subjects were obtained. By determining the placement of the art performance of the intellectually handicapped pupils, an approximate art performance age was calculated.

Art Interest Inventory

A questionnaire was developed requiring the children to identify a preferred class teacher in various situations. On it was indicated the teacher liked best and the teacher liked least from his schedule of school instructors. The same form was administered to pupils of all levels; however, the interview technique was employed at the primary age level. The questionnaire was one way of attempting to assess the relative popularity of the art program.

Art Evaluation Conference

To evaluate the completed art product a list of questions relating to techniques and materials was checked by the subjects. Specific reactions to the various aspects of the completed project were registered. All age levels used the same form. Primary level children indicated their reactions to questions verbally as the teacher or interviewer recorded their responses.

Motor Coordination Appraisal

To measure the motor skills of the subjects, an evaluation checklist was used. Motor skills in life situations were rated by the classroom teacher. A 4-point scale ranging from 0 indicating total inability, to 3 indicating better than normal ability was used. Pupils of all age levels were subjected to the same appraisal form. The pre-evaluation was recorded at the beginning of the study; the post-evaluation at the end of the school year.

Parent Interview Questionnaire

To measure the growth in the attitudes of pupils toward the school situation and their interest in specific school situations as they were revealed in the home, an informal questionnaire was administered to the parents of the subjects. The same form was administered at the beginning and the end of the project. The information gained by the use of this technique will be utilized in the interpretation of statistical findings.

Characteristics of the Teaching Process

In order to determine the teaching procedures utilized, a questionnaire was completed by each teacher at the conclusion of each art activity. The items contained were to indicate the presence or absence of certain characteristics of the art experience. The information gained by the use of this questionnaire will be utilized in the interpretation of statistical findings.

Art Behavior Rating Scale

A 5-point scale was developed to evaluate the generalized aspects of a child's approach and reaction to an art activity. This form was completed by the teacher on the basis of interviews held prior to and at the completion of the project.

EXPERIMENTAL DESIGN

Planning of the educational program for Special Education class pupils included in the project began early in the preceding year. The art experiences of the subjects had been relatively equivalent up to the time of the initiation of the project. The school policy had provided for the assistance of a helping teacher in art in the self-contained special classroom on the same scheduling as in the regular class-rooms.

In establishing the control and experimental groups, it was considered essential to study the teaching techniques of individual teachers, for this factor was thought to be important in controlling the instructional situation. Art teachers who habitually used the teaching techniques of 2-dimensional art and their accompanying materials were preferred for assignment to the control groups. Teachers who had expressed interest and evidenced more production in 3-dimensional areas using resist materials were utilized as instructors of the experimental classes.

One exception to the equation of groups in interest, training and experience in art was in the case of two secondary level teachers who had been instrumental in promoting interest in the study of this problem. These two teachers were the instigators of the pilot study and had been aware of certain differences in response to materials by these pupils. This factor was taken into consideration by using one of these "specialists" as a control group teacher with the other teaching an experimental group. This assured that equal numbers in both groups would be exposed to the leadership of a more experienced person. The control group teacher attempted to guard against using techniques or materials which might be found in experimental activities.

BACKGROUND OF THE TEACHERS

The classroom teachers participating in the study of the experimental program in art for intellectually handicapped pupils were certified teachers. All were experienced in teaching special classes for mentally retarded and slow-learning pupils All of the art teachers involved in the study were similarly qualified in their area of specialty. All teachers selected to work on the project expressed either a particular interest in art instruction for the intellectually handicapped, or were interested in the broader field of improvement of instructional methods for these pupils. Teachers involved in the study included 4 regular art teachers, 4 art helping teachers participating at the primary and intermediate levels, and ten special education classroom teachers.

INSTRUCTIONAL ACTIVITIES

Classes

The four special education classes at the secondary level were located in modern high schools. It had not been the policy of the school system for special art classes to be scheduled for these groups. Administrators were anxious to cooperate in setting up the project program. The art classes in which the subjects were enrolled were taught by the regular art instructors in the art laboratories of the school. These classes were not designated as differing in any way from classes scheduled for the rest of the school population. The special art classes met for one period each day and were arranged to fit into the schedule of the pupil.

The primary and intermediate classes were located in 4 elementary schools. Each building at this level contained 2 special classes, one of the primary and one of the intermediate level. Since the art instructor was an itinerant teacher having many classes in more than one school, it seemed advisable to designate the art specialist at a particular school either as a control or an experimental teacher. Each art helping teacher designated as a control teacher had a control group at both the primary and the intermediate levels, while the experimental teachers had an experimental group at both the primary and the intermediate levels. In one situation, the art helping teacher instructed 4 classrooms with 2 groups at each level.

All classrooms for the special students at the primary and intermediate levels were equipped with water, stove, sink, refrigerator and some, a kiln. All classes had access to a work area and kiln facilities.

Curriculum

In order to test the hypotheses, development of a two pronged curriculum was necessary. Teachers of the experimental group were provided with a list of teaching techniques found effective in the pilot study. Lesson plans developed by this group provided opportunity for the use of distinct methods with materials which offered resistance when used. Teachers of the control groups were instructed to use techniques and materials recommended by the art department of the public schools which were common to the grade level of the regular classrooms. Control groups were warned to use only the traditional materials which are used in two-dimensional art projects and offer little resistance when used.

Plans were requested from each teacher according to the type of curriculum her group was to follow. This allowed for the provision of special materials and supplies so that ample teaching materials of the nature described were on hand for the beginning and throughout the school term.

Instructional Supplies

The usual art materials ordered by teachers on their budget requests of the previous year were provided by the local school system. In addition, the project budget provided for purchase of special materials desired for experimental use. Materials requested for the experimental group were more often supplies used by householders in building, repairing or improving the surface of objects and came from the local building supply company. Materials ordered for the control group were more closely associated with the area of the fine arts and were obtained from art supply distributors.

Testing

At the beginning of the school year, pre-testing was carried on by the regular classroom teacher, project personnel, and art teacher, depending upon the nature of the instrument being administered. The pupils seemed to enjoy the testing experience and were assured that their performance on the test would have no effect on their school grades. In the case of the art tests, the classroom teacher joined the pupils in taking the tests and this further diminished their fears. During the last month of instruction, the corresponding post-tests were administered by the same personnel. Samples of students art work were retained for evaluation and display purposes, but all products were returned to the pupil if requested.

Instructional Program

Each of the class groups completed fifteen art activities using the appropriate methods and materials, depending on whether it was designated as a control or experimental group. Experimental lessons adhered to curriculum modifications in materials and/or adjustment of the time allotment. Teachers were asked to retain the art objects for display and photographing. Each object was evaluated by use of the teacher - pupil conference sheet. Some activities began with sketching the proposed object on this form. Pupil reactions were noted at the completion of the art task. In some cases a final photograph of the completed object was attached to the conference sheet. This brief record of planning, evaluation procedure and photograph of the product helped to recall the total experience when the subjects were asked to designate their preference at the end of fifteen activities. An extensive exhibit of pupil art served to culminate the plans and efforts of both teachers and pupils. Assembling the finished products gave the subject an opportunity to review his experience, voice appreciation of his efforts and register reaction to the materials and activities.

Statistical Treatment*

Statistical analyses were performed on the data provided by the various measures used in this study according to a pre-assignment of individuals into one of six groups. The completed experimental design involved the establishment of a control group and an experimental group at each of the three levels. All individuals were measured prior to (pre-test) and at the end of (post-test) the project.

Three different statistical procedures were applied to determine whether or not significant differences existed. Individual measures on the California Achievement Test and Graves Design-Judgment Test were treated using the Analysis of Variance, Single Variable of Classification, Model I as described by Dixon and Massey[4]. The Chi-Square Test, Two-by-Two Table Technique, described by Dixon and Massey[4] was used in the treatment of the data obtained from the Art Interest Inventory.

The Sign-Test technique as described by Tate and Clelland[17] was applied to pre-and post-test data obtained from the Motor Coordination Appraisal, the Rating Schedule for Classes of Exceptional Children and the Art Behavior Scale.

The reporting of the means for the Wartegg Test and the Art Evaluation Conference and a graphical treatment of the data from the Art Sample Index and the Characteristics of Teaching Process, although not treated statistically, are used to furnish information about the population.

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* the statistical treatment of the data was prepared and carried out by Mr. George Gabriel, Graduate Assistant, College of Education, University of Maryland.

CHAPTER III

RESULTS

Treatment of the data will be according to the three maturity levels: primary, intermediate, and secondary as well as the total experimental and control sample. Pre-test and post-test data will be utilized in all areas where appropriate.

Findings presented in this chapter will be reported according to the questions asked in the Introduction, Page 4.

QUESTION I: DOES AN EXPERIMENTAL PROGRAM IN ART AFFECT THE ACADEMIC PROGRESS OF PUPILS AS MEASURED BY THE CALIFORNIA ACHIEVEMENT TEST?

The pre-and post-test scores on the C.A.T. for the experimental and control groups at the primary level were subjected to statistical analysis in order to determine the existence of any differences.

Table II presents the means and standard deviations of C.A.T. scores on pre-and post-tests for the experimental and control groups at the primary level.

TABLE II

MEANS AND STANDARD DEVIATIONS OF C.A.T. SCORES ON PRE-TEST AND POST-TEST DATA FOR THE EXPERIMENTAL AND CONTROL GROUPS IN READING, ARITHMETIC AND LANGUAGE AT THE PRIMARY LEVEL

MEASURES	STATISTICS	CONTROL			EXPERIMENTAL		
		N	Pre-Test	Post-Test	N	Pre-test	Post-test
Reading	$\bar{x}$	18	1.38	1.86	24	1.84	2.32
	s		.37	.42		.80	.80
Arithmetic	$\bar{x}$	18	1.63	2.07**	24	2.15	2.58
	s		.55	.36		.80	.65
Language	$\bar{x}$	18	1.05	1.75**	24	1.47	2.35**
	s		.38	.38		.87	.91

**significant at or less than the .01 level

Table III presents the analysis of variance of the C.A.T. reading scores on the pre-test at the primary level.

TABLE III

ANALYSIS OF VARIANCE OF THE C.A.T. READING SCORES ON THE PRE-TEST AT THE PRIMARY LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	2.63	.88	2.00
Within Classes	38	16.67	.44	
Total	41			

The analysis of variance of the C.A.T. reading pre-test sub-scale scores for the two groups (TABLE III) did not reach a significant F level. It is assumed that the intra-group variation at this level was non-significant. The experimental and control groups do not show significant variability on C.A.T. reading scores at the beginning of the project.

Table IV presents the analysis of variance of the C.A.T. reading scores on the post-test at the primary level.

TABLE IV

ANALYSIS OF VARIANCE OF THE C.A.T. READING SCORES ON THE POST-TEST AT THE PRIMARY LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	2.82	.94	2.08
Within Classes	38	17.26	.45	
Total	41			

Since the acquired F level derived for the post-test reading scores in the primary group (TABLE IV) was less than the criterion level, the variation between the experimental groups in the reading area at the end of the project was not significant. No significant reading scores were obtained on the post-test data for the two groups. No significant alteration of academic performance in the reading area can be attributed to the experimental procedures.

Table V presents the analysis of variance of the C.A.T. arithmetic scores on the pre-test at the primary level.

The analysis of variance of the C.A.T. arithmetic pre-test sub-scale scores for the two groups (TABLE V) did not reach a significant F level. It is assumed that the intra-group variation at this level was non-significant.

TABLE V

ANALYSIS OF VARIANCE OF THE C.A.T. ARITHMETIC SCORES ON THE PRE-TEST AT THE PRIMARY LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	4.15	1.38	2.82
Within Classes	38	18.77	.49	
Total	41			

Table VI presents the analysis of variance of the C.A.T. arithmetic scores on the post-test at the primary level.

TABLE VI

ANALYSIS OF VARIANCE OF THE C.A.T. ARITHMETIC SCORES ON THE POST-TEST AT THE PRIMARY LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	3.74	1.25	4.46**
Within Classes	38	10.64	.28	
Total	41	14.38		

**significant at or less than .01 level

Since the acquired F level derived for the post-test arithmetic scores in the primary group (TABLE VI) was greater than the criterion level there is variation between the experimental groups in the arithmetic area at the end of the project. This would suggest that the experimental procedures had some effect upon the performance in this academic skill area.

Table VII presents the analysis of variance of the C.A.T. language scores on the pre-test at the primary level.

TABLE VII

ANALYSIS OF VARIANCE OF THE C.A.T. LANGUAGE SCORES ON THE PRE-TEST AT THE PRIMARY LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	2.45	.82	1.61
Within Classes	38	19.43	.51	
Total	41	21.88		

The analysis of variance of the C.A.T. language pre-test sub-scale scores for the two groups (TABLE VII) did not reach a significant F level. It is assumed that the intra-group variation at this level was non-significant and that differences do not exist at the initiation of the project period.

Table VIII presents the analysis of variance of the C.A.T. language scores on the post-test at the primary level.

TABLE VIII

ANALYSIS OF VARIANCE OF THE C.A.T. LANGUAGE SCORES ON THE POST-TEST AT THE PRIMARY LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	7.73	2.58	5.73**
Within Classes	38	17.06	.45	
Total	41			

** significant at or less than .01 level

Since the acquired F level derived for the post-test language scores in the primary group (TABLE VIII) was greater than the criterion level there is variation between the experimental groups in the language area at the end of the project. This represents an increase in variability from the pre-test period. This pattern may also reflect a growth effect of the experimental procedure upon the academic performance of the subjects.

According to the data, the pre-test for both experimental and control groups shows no significant variation at the .01 level for any of the three skill areas.

On the post-test, the arithmetic and the language scores show significant variation. The experimental program in art seems to be associated with the differentiation of the academic progress of pupils in language and arithmetic at the primary level. The lack of alteration in the reading skills may reflect the maturity level of the pupils in the primary classes. It might also reflect a less related association between reading skill and art behavior than do arithmetic and the broad area of language arts.

Since art and language are mediums of individual expression, it is possible that this relationship might account for the change shown. Many activities within the experimental art program provided opportunities for pupils to utilize numerical concepts to accomplish art tasks. These concrete and tactile experiences within the arithmetic area could account for the improvement in this area at the primary level.

The pre-and post-test scores on C.A.T. for the experimental and control groups at the intermediate level were subjected to statistical analysis in order to determine the existence of any differences.

Table IX presents the means and standard deviations of the C.A.T. scores on pre-and post-test scores for the experimental and control groups at the intermediate level.

TABLE IX

MEANS AND STANDARD DEVIATIONS OF C.A.T. SCORES ON PRE-TEST AND POST-TEST DATA FOR THE EXPERIMENTAL AND CONTROL GROUPS IN READING, ARITHMETIC AND LANGUAGE AT THE INTERMEDIATE LEVEL

MEASURES	STATISTICS	CONTROL			EXPERIMENTAL		
		N	Pre-Test	Post-Test	N	Pre-Test	Post-Test
Reading	$\bar{x}$	22	2.85	3.13	22	3.19	3.66
	s		1.06	.68		1.17	1.10
Arithmetic	$\bar{x}$	22	3.23	3.49	22	3.52	3.84
	s		.84	.60		.85	.78
Language	$\bar{x}$	22	2.60	3.50	22	3.04	3.75
	s		.91	.82		1.33	1.45

Table X presents the analysis of variance of the C.A.T. reading scores on the pre-test at the intermediate level.

TABLE X

ANALYSIS OF VARIANCE OF THE C.A.T. READING SCORES ON THE PRE-TEST AT THE INTERMEDIATE LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	7.26	2.42	2.09
Within Classes	40	46.45	1.16	
Total	43			

The analysis of variance of the C.A.T. reading pre-test sub-scale scores for the two groups (TABLE X) did not reach a significant F level. It is assumed that the intra-group variation at this level is non-significant.

Table XI presents the analysis of variance of the C.A.T. reading scores on the post-test at the intermediate level.

TABLE XI

ANALYSIS OF VARIANCE OF THE C.A.T. READING SCORES ON THE POST-TEST AT THE INTERMEDIATE LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	4.99	1.66	1.98
Within Classes	40	33.42	.84	
Total	43			

Since the acquired F level for the post-test reading scores in the intermediate group (TABLE XI) was less than the criterion level, the variation between the experimental groups in the reading area at the end of the project period was non-significant.

On the analysis of variance on both the pre-test and post-test scores a significant F level was not reached. There was no outstanding variability between the experimental and control groups prior to the project activities. This situation was not altered appreciably by the experimental procedure.

Table XII presents the analysis of variance of the C.A.T. arithmetic scores on the pre-test at the intermediate level.

TABLE XII

ANALYSIS OF VARIANCE OF THE C.A.T. ARITHMETIC SCORES ON THE PRE-TEST AT THE INTERMEDIATE LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	10.45	3.48	6.82**
Within Classes	40	20.57	.51	
Total	43			

** significant at or less than .01 level

The analysis of variance of the C.A.T. arithmetic pre-test sub-scale scores for the two groups (TABLE XII) did reach a significant F level.

Table XIII presents the analysis of variance of the C.A.T. arithmetic scores on the post-test at the intermediate level.

Since the acquired F level derived for the post-test arithmetic scores in the intermediate group(TABLE XIII) was greater than the criterion level there is variation between the experimental groups in the arithmetic area at the end of the project.

TABLE XIII

ANALYSIS OF VARIANCE OF THE C.A.T. ARITHMETIC SCORES ON THE POST-TEST AT THE INTERMEDIATE LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	5.38	1.79	4.37**
Within Classes	40	16.35	.41	
Total	43			

** significant at or less than .01 level

Since the analysis of variance on both the C.A.T. pre-and post-test scores elicits an F ratio significant at the .01 probability level, the variation cannot be attributed to the experimental procedure. Since the F ratio is less significant on the post-test scores, the impact of the experimental procedure cannot be credited with the change. This occurrence may be due to the fact that by the intermediate level, basic arithmetic skills usually measured by the C.A.T. are fairly well established.

Table XIV presents the analysis of variance of the C.A.T. language scores on the pre-test at the intermediate level.

TABLE XIV

ANALYSIS OF VARIANCE OF THE C.A.T. LANGUAGE SCORES ON THE PRE-TEST AT THE INTERMEDIATE LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	2.25	.75	.55
Within Classes	40	54.84	1.27	
Total	43	57.09		

The analysis of variance of the C.A.T. language pre-test sub-scale scores for the two groups (TABLE XIV) did not reach a significant F level. It is assumed that the intra-group variation at this level was non-significant.

Table XV presents the analysis of variance of the C.A.T. language scores on the post-test at the intermediate level.

Since the acquired F level for the post-test language scores in the intermediate group (TABLE XV) was less than the criterion level, the variation between the experimental groups in the language area at the end of the project was non-significant.

TABLE XV

ANALYSIS OF VARIANCE OF THE C.A.T. LANGUAGE SCORES ON THE POST-TEST AT THE INTERMEDIATE LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	5.55	1.85	1.38
Within Classes	40	53.57	1.34	
Total	43	59.12		

Since variation on the C.A.T. language scores for both the pre-and post-test data was non-significant, the experimental procedure cannot be credited with significantly altering growth in the language area as measured by the C.A.T. A somewhat larger F ratio on the post-test might indicate a tendency toward such effects.

In examining the comparison on the three skill areas for the intermediate level, the reading and language areas fail to display significance at either the pre-or post-test stages. Lack of variation thus exists at the initiation of the project and maintains itself throughout. The arithmetic scores show the reverse. Significant variation exists on both the pre-and post-test scores. This may be due to the fact that the arithmetic area represents a more concrete realm for mastery of material called for on the achievement tests; whereas the language areas encompass a more diffuse and less exact skill.

Since the ability of intermediate children remains in the oral language level with little if any competence evident in written skills, it may be that any effects of the art program were less evident on these measures. With the mental age of most pupils in the intermediate class remaining below the six and one-half year level the probability of more than meager gain in the reading area would seem unlikely.

Table XVI presents the means and standard deviation of C.A.T. scores on pre-and post-tests for the experimental and control groups at the secondary level.

Table XVII presents the analysis of variance of the C.A.T. reading scores on the pre-test at the secondary level.

The analysis of variance of the C.A.T. reading pre-test sub-scale scores for the two groups (TABLE XVII) did reach a significant F level indicating extreme variability within the groups.

Table XVIII presents the analysis of variance of the C.A.T. reading scores on the post-test at the secondary level. Here again a highly significant F was obtained. While it is of lesser magnitude than that obtained on the pre-test, significant variation between the groups exists on C. A. T. reading scores at the termination of the project.

TABLE XVI

MEANS AND STANDARD DEVIATIONS OF C. A. T. SCORES ON PRE-TEST AND POST-TEST DATA FOR THE EXPERIMENTAL AND CONTROL GROUPS IN READING, ARITHMETIC AND LANGUAGE AT THE SECONDARY LEVEL

MEASURES	STATISTICS	CONTROL			EXPERIMENTAL		
		N	Pre-test	Post-Test	N	Pre-Test	Post-Test
Reading	$\bar{X}$	23	6.14	5.78	30	4.83	5.37
	s		2.54	2.26		1.47	1.73
Arithmetic	$\bar{X}$	23	5.70	5.61	30	5.51	5.88
	s		1.29	1.34		1.77	1.68
Language	$\bar{X}$	23	6.11	6.11	30	5.04	5.47
	s		2.47	2.07		1.79	1.77

TABLE XVII

ANALYSIS OF VARIANCE OF THE C. A. T. READING SCORES ON THE PRE-TEST AT THE SECONDARY LEVEL

Sources of Variation	D. F.	Sum of Sq.	Means Sq.	F
Between Classes	3	135.03	45.01	24.06**
Within Classes	49	91.64	1.87	
Total	52	226.67		

** significant at or less than the .01 level

TABLE XVIII

ANALYSIS OF VARIANCE OF THE C. A. T. READING SCORES ON THE POST-TEST AT THE SECONDARY LEVEL

Sources of Variation	D. F.	Sum of Sq.	Means Sq.	F
Between Classes	3	92.28	30.09	13.20**
Within Classes	49	111.51	2.28	
Total	52			

** significant at or less than .01 level

Table XIX and Table XX present the analysis of variance of the C. A. T. arithmetic scores at the secondary level, pre-test and post-test. Since a significant F level was reached at both test periods, it appears that the initial intra-group variation noted on the pre-test is essentially maintained over the experimental period.

TABLE XIX

ANALYSIS OF VARIANCE OF THE C.A.T. ARITHMETIC SCORES ON THE PRE-TEST AT THE SECONDARY LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	38.76	12.92	9.1**
Within Classes	49	69.49	1.42	
Total	52			

** significant at or less than the .01 level

TABLE XX

ANALYSIS OF VARIANCE OF THE C.A.T. ARITHMETIC SCORES ON THE POST-TEST AT THE SECONDARY LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	37.52	12.51	7.19**
Within Classes	49	85.43	1.74	
Total	52	122.96		

** significant at or less than the .01 level

Table XXI and Table XXII present the pre-and post-test analysis of variance of the C.A.T. language scores at the secondary level. The initial ratio of significance on the language sub-scale scores was only minimally decreased on the post-test at both test periods. Highly significant F ratios are present. This would suggest minimal effect of the experimental procedure with this secondary age level on C.A.T. language scores.

TABLE XXI

ANALYSIS OF VARIANCE OF THE C.A.T. LANGUAGE SCORES ON THE PRE-TEST AT THE SECONDARY LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	114.00	38.00	14.50 **
Within Classes	49	128.24	2.62	
Total	52	242.24		

** significant at or less than the .01 level

In the C.A.T. analysis of variance of all three skill areas a significant F level was reached on both pre-and post-test data for the secondary level. In general, a slight diminishment of the size of the F ratio was found from pre- to post-test sets of scores in reading, arithmetic and language. While the experimental procedure did not appreciably alter the pattern of variation of the groups, it may have contributed to the homogeneity of the secondary population.

The effect of the experimental art program upon the academic progress of the pupils as measured by the California Achievement Test shows a somewhat different pattern at the various academic levels. The level at which the experimental procedures would seem to have been more influential in effecting change is the primary level in the arithmetic and language areas. In all other levels and subject areas the pre-test pattern is essentially maintained although the magnitude of the difference between the two groups is altered in some instances.

TABLE XXII

ANALYSIS OF VARIANCE OF THE C.A.T. LANGUAGE SCORES ON THE POST-TEST AT THE SECONDARY LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	76.92	25.64	11.05**
Within Classes	49	113.45	2.32	
Total	52	190.37		

** significant at or less than the .01 level

QUESTION 2: IS THERE A RELATIONSHIP BETWEEN THE EXPERIMENTAL PROGRAM IN ART AND MOTOR COORDINATION AS DETERMINED BY THE MOTOR COORDINATION APPRAISAL?

Table XXIII presents the average rating of categories on the Motor Coordination Appraisal on the pre-test and post-test for the experimental and control groups at the primary level.

According to the data, it would appear that there was no initial significant difference in the motor coordination of the two groups at the primary level in the areas measured by this scale. The experimental group shows higher ratings on the post-test in contrast to the control group. This would seem to be related to the experimental procedures in the former group.

Table XXIV presents the average rating of categories on the Motor Coordination appraisal on the pre-test and post-test for the experimental and control groups at the intermediate level.

At both test periods the sign test indicates significant divergence between the experimental and control groups on the motor skills measured by the Appraisal. On the pre-test comparison a more critical level of difference is present (.01)

TABLE XXIII

AVERAGE RATING OF CATEGORIES ON THE MOTOR COORDINATION APPRAISAL ON THE PRE-TEST AND POST-TEST FOR THE EXPERIMENTAL AND CONTROL GROUPS AT THE PRIMARY LEVEL

	Pre-test			Post-test **		
Categories	Control	Exp.	Sign	Control	Exp.	Sign
I. Walking	1.78	1.87	-	1.78	2.09	-
II. Eating	1.89	1.65	+	1.83	1.91	-
III. Dressing	1.44	1.70	-	1.56	1.96	-
IV. Manuscript Printing	1.28	1.26	+	1.61	1.78	-
V. Cursive Writing	0.00	.76	-	.17	.67	-
VI. Running & Jumping	1.67	1.70	-	1.67	1.83	-
VII. Throwing & Catching Ball	1.72	1.74	-	1.56	1.78	-
VIII. Operation Typewriter	00	00		00	00	
IX. Operation Sewing Machine	00	00		00	00	
X. Operation Jig-saw	00	00		00	00	
XI. Operation Electric Iron	00	00		00	00	
XII. Bicycle Riding	1.28	1.00	+	1.33	1.44	-
XIII. Calisthenics	1.72	1.61	+	1.61	1.96	-
XIV. Rhythms to Music	1.67	1.65	+	1.67	1.87	-
XV. Square Dancing	00	.74	-	00	1.04	-
XVI. Ballroom Dancing	00	.22	-	00	.78	-
XVII. Tap Dancing	00	00		00	00	
XVIII. Ballet	.50	1.67		00	.89	-
N = 13			+ = 5	N = 13		+ = 0

** statistical significance exists between the experimental and the control group at the .01 level

than at the post-test period (.05). In both instances the experimental group seems to display the greater amount of variability. The indication of lesser divergence on the post-test, though in the same direction, would seem to indicate negligible effect of the experimental procedure on the alteration of motor patterns at the intermediate level.

TABLE XXIV

AVERAGE RATING OF CATEGORIES ON THE MOTOR COORDINATION APPRAISAL ON THE PRE-TEST AND POST-TEST FOR THE EXPERIMENTAL AND CONTROL GROUPS AT THE INTERMEDIATE LEVEL

	Pre-test**			Post-test*		
Categories	Control	Exp.	Sign	Control	Exp.	Sign
I. Walking	1.86	2.05	-	1.86	2.05	-
II. Eating	1.95	2.05	-	1.91	2.05	-
III. Dressing	2.00	2.41	-	2.00	2.41	-
IV. Manuscript Printing	1.55	1.68	-	1.73	1.68	+
V. Cursive Writing	1.09	1.18	-	1.41	1.23	+
VI. Running & Jumping	1.77	2.27	-	2.05	2.18	-
VII. Throwing & Catching Ball	1.91	2.27	-	2.14	2.18	-
VIII. Operation of Typewriter	.36	.67	-	.29	.78	-
IX. Operation of Sewing Machine	.14	.67	-	.14	.78	-
X. Operation of Jig-saw	0	0	-	0	0	
XI. Operation of Electric Iron	1.14	1.20	-	1.21	1.30	-
XII. Bicycle Riding	1.71	2.28	-	1.67	2.33	-
XIII. Calisthenics	1.73	2.05	-	1.91	2.00	-
XIV. Rhythms to Music	1.73	2.05	-	1.86	2.05	-
XV. Square Dancing	1.00	1.91	-	1.10	1.91	-
XVI. Ballroom Dancing	.21	2.00		.29	1.95	
XVII. Tap Dancing	.36	1.32		.29	1.27	
XVIII. Ballet	.07	1.22		0	1.22	
	N = 14		p = 0	N = 14		p = 2

** statistical significance exists between the experimental and the control group at the .01 level

* statistical significance exists between the experimental and the control group at the .05 level

Table XXV presents the average rating of categories on the Motor Coordination Appraisal on the pre-test and post-test for the experimental and control groups at the secondary level.

TABLE XXV

AVERAGE RATING OF CATEGORIES ON THE MOTOR COORDINATION APPRAISAL ON THE PRE-TEST AND POST-TEST FOR THE EXPERIMENTAL AND CONTROL GROUPS AT THE SECONDARY LEVEL

	Pre-test *			Post-test		
Categories	Control	Exp.	Sign	Control	Exp.	Sign
I. Walking	2.14	1.83	+	2.23	1.97	+
II. Eating	2.18	1.93	+	2.27	2.00	+
III. Dressing	2.27	1.90	+	2.32	2.07	+
IV. Manuscript Printing	1.52	1.27	+	1.62	1.70	-
V. Cursive Writing	1.76	1.07	+	1.81	1.53	+
VI. Running & Jumping	1.77	1.93	-	1.82	2.00	-
VII. Throwing & Catching Ball	1.91	2.00	-	2.00	2.00	
VIII. Operation of Typewriter	.78	.47	+	.89	.83	+
IX. Operation of Sewing Machine	.50	.31	+	.63	.83	-
X. Operation of Jig-saw	1.89	.57	+	2.00	.97	+
XI. Operation of Electric Iron	.13	.97	-	.25	1.30	-
XII. Bicycle Riding	2.00	1.83	+	2.44	1.90	+
XIII. Calisthenics	1.91	1.41	+	1.82	1.76	+
XIV. Rhythms to Music	2.38	1.75	+	2.63	1.75	+
XV. Square Dancing	1.25	1.25		1.50	1.54	-
XVI. Ballroom Dancing	1.92	1.23	+	1.92	1.54	-
XVII. Tap Dancing	0	0		0	0	
XVIII. Ballet	0	0		0	0	
	N = 15		r = 3	N = 15		r = 6

* statistical significance exists between the experimental and the control group at the .05 level

The pre-test comparisons utilizing the sign test resulted in statistical significance between the experimental and control groups at the .05 level. An examination of the direction of the indices suggests that the divergence is contributed to primarily by the control group. This would indicate that prior to the experimental procedures the control group scored significantly higher on these specific motor skills. At the post-test period statistical significance was not achieved in a sufficient number of categories to warrant beyond chance reliability. This occurrence would suggest that the experimental procedure contributed to the maturation of the experimental group sufficiently to negate the pre-test differences.

In considering the overall pattern, the developmental characteristic associated with the various levels would seem to be a major factor in the trends noted. The primary and the secondary levels seem to be more amenable to modification of motor skill performance by the kinds of activities in the project. The intermediate group seems more stabilized within their maturational level and therefore less influenced by specific procedures. It is also possible that the categories tapped by this instrument differentiate more discreetly at the primary and secondary levels rather than at the intermediate. The specific effect of the experimental procedure seems to be manifest somewhat differently at the two extreme levels. The primary level group reacted more in terms of development beyond their peers whereas the secondary level seemed to reflect the effects of opportunities to mature within more restricted strata.

QUESTION 3: DO DIFFERENCES EXIST BETWEEN EXPERIMENTAL AND CONTROL GROUPS IN GENERAL BEHAVIOR AS MEASURED BY THE PROPOSED RATING SCHEDULE FOR CLASSES OF EXCEPTIONAL CHILDREN?

Table XXVI presents the average rating of categories on the Proposed Rating Schedule for Classes of Exceptional Children on pre-and post-tests for experimental and control groups at the primary level.

At the primary level no significant differences exist between the control group and the experimental group on the pre-test data using the sign test. The experimental procedure seems to have contributed to alteration of general behavior patterns of the experimental group on the post-test data in contrast to a pattern of non-differentiation between the control and experimental groups on the same instrument prior to the initiation of the project procedures.

Table XXVII presents the average rating of categories on the Proposed Rating Schedule for Classes of Exceptional Children on pre-and post-tests for the experimental and control groups at the intermediate level.

TABLE XXVI

AVERAGE RATING OF CATEGORIES ON THE PROPOSED RATING SCHEDULE FOR CLASSES OF EXCEPTIONAL CHILDREN FOR THE PRE-TEST AND POST-TEST OF EXPERIMENTAL AND CONTROL GROUPS AT THE PRIMARY LEVEL

Time of Collection	N	AVERAGE RATING OF CATEGORIES									
		I	II	III	IV	V	VI	VII	VIII	IX	X
Pre-test											
Experimental Group	22	5.18	4.45	5.23	5.09	5.09	4.27	4.95	4.73	3.77	3.68
Control Group	18	3.78	4.17	4.72	4.06	4.83	3.67	4.67	4.72	3.94	4.17
Post-test**											
Experimental Group	22	5.36	4.77	5.46	5.55	5.91	4.73	5.23	5.18	5.09	4.55
Control Group	18	4.61	4.50	4.28	4.17	5.00	4.06	5.39	4.00	4.28	4.11

** statistical significance exists at or below the .05 level

Application of the Sign Test to the data indicates that while no significant difference exists between the experimental and the control group on the pre-test, significance at the .05 level of probability is obtained on the post-test comparison. This would suggest an effect of the experimental art procedure on the behavior of the subjects in the experimental sections since the experimental group displays the higher scores at this point.

Table XXVIII presents the average rating of categories on the Proposed Rating Schedule for Classes of Exceptional Children on pre-and post-tests for the experimental and control groups at the secondary level.

On the comparison of the experimental and control groups at the secondary level no significant differences exist on the analysis of the pre-test scores of the Proposed Rating Schedule for Classes of Exceptional Children. On the post-test data, significance at the .05 level was found in favor of the control group. This represents a shift in the direction of the influence of the experimental procedures.

From an examination of the data, it can be assumed that the experimental art procedure has an effect on the various class levels in measures of general

TABLE XXVII

AVERAGE RATING OF CATEGORIES ON THE PROPOSED RATING SCHEDULE FOR CLASSES OF EXCEPTIONAL CHILDREN FOR THE PRE-TEST AND POST-TEST OF EXPERIMENTAL AND CONTROL GROUPS AT THE INTERMEDIATE LEVEL

Time of Collection	N	AVERAGE RATING OF CATEGORIES									
		I	II	III	IV	V	VI	VII	VIII	IX	X
Pre-test											
Experimental Group	21	5.33	4.29	5.14	5.57	4.81	4.52	5.14	4.95	3.10	3.19
Control Group	22	4.55	4.33	4.68	4.50	4.77	4.27	4.59	4.77	4.05	4.27
Post-test*											
Experimental Group	21	5.57	5.19	5.38	5.76	5.91	4.76	5.48	5.29	4.62	4.57
Control Group	22	5.41	5.36	4.77	4.59	5.05	3.59	4.55	4.82	4.23	4.18

* statistical significance exists at the .05 level

TABLE XXVIII

AVERAGE RATING OF CATEGORIES ON THE PROPOSED RATING SCHEDULE FOR CLASSES OF EXCEPTIONAL CHILDREN FOR THE PRE-TEST AND POST-TEST OF EXPERIMENTAL AND CONTROL GROUPS AT THE SECONDARY LEVEL

Time of Collection	N	AVERAGE RATING OF CATEGORIES									
		I	II	III	IV	V	VI	VII	VIII	IX	X
Pre-test											
Experimental Group	34	4.79	4.79	5.26	5.03	5.06	4.56	5.12	5.12	4.47	4.41
Control Group	23	5.09	4.96	5.17	5.57	5.52	4.96	5.30	4.87	4.43	4.74
Post-test*											
Experimental Group	34	5.06	5.12	5.38	5.35	5.21	4.79	5.12	5.21	4.82	4.85
Control Group	23	5.57	5.26	5.78	5.83	5.83	5.09	5.65	5.26	4.83	4.83

* statistical significance exists at the .05 level

classroom behavior. The effect of the experimental procedures and materials seems to be more critical with the younger children since the sign test shows significance at the .01 level in favor of the experimental group at the primary level and at the .05 level in favor of the experimental group at the intermediate level. The change observed in the secondary group does not show the same direction pattern. Age factors, as well as individual characteristics of the situation, may account for the pattern shown.

QUESTION 4: DO DIFFERENCES EXIST BETWEEN THE EXPERIMENTAL AND CONTROL GROUPS IN ART BEHAVIOR AS MEASURED BY THE ART BEHAVIOR RATING SCALE?

Table XXIX presents the average ratings of categories on the pre-test and post-test of the Art Behavior Rating Scale for the experimental and control groups for all three levels.

TABLE XXIX

AVERAGE RATING OF CATEGORIES ON THE ART BEHAVIOR RATING SCALE FOR THE PRE-TEST AND POST-TEST OF THE EXPERIMENTAL AND CONTROL GROUPS FOR ALL THREE LEVELS COMBINED

	Collection Time					
Categories	Pre-test			Post-test		
	Control N = 76	Exp. N = 69	Sign	Control N = 76	Exp. N = 69	Sign
I. Concentration	3.43	3.43		3.97	3.96	—
II. Animation	3.24	3.45	-	3.78	3.64	-
III. Desire to Complete	3.84	3.67	+	3.96	4.16	-
IV. What to do with it	2.70	2.80	-	3.04	3.46	-
V. Enjoyment	3.38	3.54	-	3.78	3.86	-
VI. Pride	3.43	3.38	+	3.74	4.09	-
n = 5			r = 2	n = 6		r = 1

The application of the Sign test to the data indicated no significance at the critical levels at either the pre-or post-test period. The experimental procedure did not seem to appreciably alter the art behavior of the subjects as measured by the Art Behavior Rating Scale.

Table XXX presents the average rating of categories on the pre-test and post-test of the Art Behavior Rating Scale for the experimental and control groups at the primary level.

TABLE XXX

AVERAGE RATING OF CATEGORIES ON THE ART BEHAVIOR RATING SCALE FOR THE PRE-TEST AND POST-TEST OF THE EXPERIMENTAL AND CONTROL GROUPS AT THE PRIMARY LEVEL

		Collection Time					
Categories		Pre-test			Post-test		
		Control N=17	Exp. N=24	Sign	Control N=17	Exp. N=24	Sign
I.	Concentration	3.05	3.29	-	3.94	3.83	+
II.	Animation	3.41	3.33	+	3.77	3.75	+
III.	Desire to Complete	3.25	3.42	-	3.65	4.00	-
IV.	What to do with it	3.12	2.50	+	3.65	3.29	+
V.	Enjoyment	3.24	3.42	-	3.88	3.83	+
VI.	Pride	3.47	3.13	+	4.06	3.88	+
	n = 6			r = 3	n= 6		r = 1

No critical statistical significance was obtained by the application of the Sign test to this data. The experimental procedure does not seem to differentiate on art skills as indicated by intervals on the Art Behavior Rating Scale with subjects at the primary level.

Table XXXI presents the average rating of categories on the pre-test and post-test of the Art Behavior Rating Scale for the experimental and control groups at the intermediate level.

The comparison of the art behavior ratings of the experimental and control groups at the intermediate level shows no statistical significance upon treatment by the Sign test on the pre-test comparison. However, on the post-test scores, significance at the .05 level was attained in favor of the control group. This represents an extension of the tendency shown at the time of the pre-test for the control group to rank higher on the scale.

TABLE XXXI

AVERAGE RATING OF CATEGORIES ON THE ART BEHAVIOR RATING SCALE FOR THE PRE-TEST AND POST-TEST OF THE EXPERIMENTAL AND CONTROL GROUPS AT THE INTERMEDIATE LEVEL

		Collection Time					
Categories		Pre-test			Post-test*		
		Control N=23	Exp. N=24	Sign	Control N=23	Exp. N=24	Sign
I.	Concentration	3.57	3.50	+	4.48	4.00	+
II.	Animation	3.39	3.46	-	4.52	3.71	+
III.	Desire to complete	4.04	3.88	+	4.48	4.17	+
IV.	What to do with it	3.43	2.50	+	4.09	3.08	+
V.	Enjoyment	3.52	3.50	+	4.30	3.83	+
VI.	Pride	3.78	3.29	+	4.43	3.92	+
	n=6			r=1	n = 6		r = 0

*statistical significance exists between the experimental and the control group at the .05 level

Table XXXII presents the average rating of categories on the pre-test and post-test of the Art Behavior Rating Scale for the experimental and control groups at the secondary level.

As has been consistently displayed at other levels the secondary level also shows no significance between the experimental and control groups on the pre-test administration of the Art Behavior Rating Scale. On the post-test significance is obtained at the .05 level with larger scores found for the experimental group. The experimental procedure and materials seem to have influenced higher ratings in the experimental group at the end of the project.

In summarizing the data of the three levels, use of the Sign test revealed change on the post-test scores of the intermediate and secondary levels at the .05 level of significance. This occurrence for both levels seems to be a trend in the same direction, though of greater magnitude, as that shown in the pre-test data, i.e., the intermediate levels tended toward significance contributed

TABLE XXXII

AVERAGE RATING OF CATEGORIES ON THE ART BEHAVIOR RATING SCALE FOR THE PRE-TEST AND POST-TEST OF THE EXPERIMENTAL AND CONTROL GROUPS AT THE SECONDARY LEVEL

		Collection Time					
Categories		Pre-test			Post-test*		
		Control N=36	Exp. N=21	Sign	Control N=36	Exp. N=21	Sign
I.	Concentration	3.53	3.52	+	3.67	4.05	-
II.	Animation	3.06	3.57	-	3.31	4.10	-
III.	Desire to Complete	3.94	3.71	+	3.78	4.33	-
IV.	What to do with it	2.03	3.48	-	2.08	4.10	-
V.	Enjoyment	3.36	3.71	-	3.39	3.90	-
VI.	Pride	3.19	3.76	-	3.14	4.52	-
		n = 6	r = 2		n = 6		r = 0

*statistical significance exists between the experimental and the control group at the .05 level

essentially by the control group whereas the secondary level derived its significant variability from the experimental group. Since the primary level comparison and the comparison for the total group shows non-significance, the impact of the experimental program upon the total population needs further investigation. It is possible that the length of the experimental program was too brief to allow for significant alteration in art behavior as measured by the Art Behavior Rating Scale.

QUESTION 5: DOES THE PUPIL'S INTEREST IN ART BECOME AFFECTED BY THE EXPERIMENTAL ART PROGRAM AS MEASURED BY THE ART INTEREST INVENTORY?

Table XXXIII presents the results of the Chi-Square Analysis of the pre-test of the Art Interest Inventory at the primary level.

TABLE XXXIII

ANALYSIS OF THE CHI-SQUARE OF THE PRE-TEST DATA OF THE ART INTEREST INVENTORY AT THE PRIMARY LEVEL

GROUPS	ART RATED BEST	ART RATED LESS THAN BEST	TOTAL
EXPERIMENTAL	5	17	22
CONTROL	2	16	18
TOTAL	7	33	40

x^2 = .424
x.99= 6.63

Since the obtained Chi-Square Index does not indicate differences at a critical level, it can be assumed that pre-test differences at the primary level are minimal. Differences do not exist between the experimental groups.

TABLE XXXIV

ANALYSIS OF THE CHI-SQUARE OF THE POST-TEST DATA OF THE ART INTEREST INVENTORY AT THE PRIMARY LEVEL

GROUPS	ART RATED BEST	ART RATED LESS THAN BEST	TOTAL
EXPERIMENTAL	3	21	24
CONTROL	2	16	18
TOTAL	5	37	42

x^2 = .118
x.99 = 6.63

Table XXXIV presents the results of the Chi-Square Analysis of the post-test of the Art Interest Inventory at the primary level.

The non-significant Chi-Square Index for the post-test analysis at the primary level reflects lack of differences in either the experimental or control groups. The ranking of their art interest rating does not seem to be dependent upon group placement.

TABLE XXXV

ANALYSIS OF THE CHI-SQUARE OF THE PRE-TEST DATA OF THE ART INTEREST INVENTORY AT THE INTERMEDIATE LEVEL

GROUPS	ART RATED BEST	ART RATED LESS THAN BEST	TOTAL
EXPERIMENTAL	9	13	22
CONTROL	9	13	22
TOTAL	18	26	44

x^2 = .94
$x_{.99}$ = 6.63

Table XXXV presents the results of the Chi-Square Analysis of the pre-test of the Art Interest Inventory at the intermediate level.

The results of this analysis with resulting non-significant Chi-Square indices indicate consistency within the experimental and control groups. The groups seem to be matched on this variable prior to the experimental procedure.

Table XXXVI presents the results of the Chi-Square Analysis of the post-test of the Art Interest Inventory at the intermediate level.

On this analysis a significant Chi-Square (12.27) is obtained. It can be assumed from this evidence that there is a relationship between an individual's art interest rating and the experiences he obtained in either the experimental or control group. An examination of the frequencies indicates that the experimental group preferred the art teacher an appreciably greater number of times than did the control. This can be assumed to be directly related to the art program being carried out by the teacher.

TABLE XXXVI

ANALYSIS OF THE CHI-SQUARE OF THE POST-TEST DATA OF THE ART INTEREST INVENTORY AT THE INTERMEDIATE LEVEL

GROUPS	ART RATED BEST	ART RATED LESS THAN BEST	TOTAL
EXPERIMENTAL	19	7	26
CONTROL	4	18	22
TOTAL	23	25	48

$x^2 = 12.27$
$x.99 = 6.63$

TABLE XXXVII

ANALYSIS OF THE CHI-SQUARE OF THE PRE-TEST DATA OF THE ART INTEREST INVENTORY AT THE SECONDARY LEVEL

GROUPS	ART RATED BEST	ART RATED LESS THAN BEST	TOTAL
EXPERIMENTAL	12	18	30
CONTROL	5	18	23
TOTAL	17	36	53

$x^2 = 1.24$
$x.99 = 6.63$

Table XXXVII presents the results of the Chi-Square Analysis of the pre-test of the Art Interest Inventory at the secondary level.

The obtained Chi-Square of 1.24 is less than that required to indicate significant variability in either the experimental or control group. Therefore the groups appear to be independent in that their initial art interest scores do not seem to be dependent upon group placement.

TABLE XXXVIII

ANALYSIS OF THE CHI-SQUARE OF THE POST-TEST DATA OF THE ART INTEREST INVENTORY AT THE SECONDARY LEVEL

GROUPS	ART RATED BEST	ART RATED LESS THAN BEST	TOTAL
EXPERIMENTAL	18	12	30
CONTROL	9	14	23
TOTAL	27	26	53

$x^2 = 1.51$
$x_{.99} = 6.63$

Table XXXVIII presents the results of the Chi-Square Analysis of the post-test of the Art Interest Inventory at the secondary level.

The non-significant Chi-Square of 1.51 indicates that we do not have evidence to support differences on the Art Interest Inventory in either the experimental or control group. The group placement of the individual does not seem to have influenced, to a critical level, his expressed general art interest and teacher preference by subject area.

The results of the Chi-Square Analysis for the experimental and control groups at all three levels for both pre-and post-test periods indicate minimal effect of the art program upon the art interests of the students. For the most part similar levels are maintained at the pre- and post-test periods. Only in the intermediate group does a change of pattern at a significant level appear. In this instance the post-test analysis indicates variability. An inspection of the data suggests that this change from the pre-test analysis is due to a more favorable rating of art in the experimental group. The appearance of significance on post-test scores at only the intermediate level might suggest a greater susceptibility to modification of attitude by educational procedures at this particular age level.

QUESTION 6: IS THE CREATIVITY OF PUPILS IN ART AFFECTED BY AN EXPERIMENTAL PROGRAM AS MEASURED BY THE WARTEGG TEST?

Tables XXXIX, XL and XLI present the mean index ratings of improvement shown by the Wartegg Test in four characteristic areas at the primary, intermediate and secondary levels.

TABLE XXXIX

AVERAGE INDEX RATINGS OF IMPROVEMENT SHOWN BY THE WARTEGG TEST IN FOUR CHARACTERISTIC AREAS AT THE PRIMARY LEVEL

CHARACTERISTICS MEASURED		N 18 CONTROL GROUP	N 24 EXPERIMENTAL GROUP
I.	COMPLETION	.50	.54
II.	EMBELLISHMENT AND DETAIL	.39	.79
III.	MATURITY OF CONCEPT	.44	.54
IV.	CONTROL (ADJUSTMENT)	1.05	1.04

The examination of the mean indices of improvement in the four characteristics measured at the primary level indicates minimal differences between the experimental and control groups. The only characteristic showing an appreciable diversion is Embellishment and Detail. In this area the experimental group shows the greater growth.

TABLE XL

AVERAGE INDEX RATINGS OF IMPROVEMENT SHOWN BY THE WARTEGG TEST IN FOUR CHARACTERISTIC AREAS AT THE INTERMEDIATE LEVEL

CHARACTERISTICS MEASURED		N 22 CONTROL GROUP	N 22 EXPERIMENTAL GROUP
I.	COMPLETION	.32	.64
II.	EMBELLISHMENT AND DETAIL	.73	.82
III.	MATURITY OF CONCEPT	.91	.91
IV.	CONTROL (ADJUSTMENT)	.68	.68

The intermediate level (Table XL) experienced improvement on the characteristics measured by the Wartegg Test in a very similar pattern for both the experimental and control groups. Mean growth indices for Maturity of Concept and Control were the same for the two groups. Only in one area, Completion, does the experimental group show a somewhat greater gain. This may be due to the characteristics of the materials in that they seem to have lent themselves more readily to successful completion.

TABLE XLI

AVERAGE INDEX RATINGS OF IMPROVEMENT SHOWN BY THE WARTEGG TEST IN FOUR CHARACTERISTIC AREAS AT THE SECONDARY LEVEL

CHARACTERISTICS MEASURED	N 19	CONTROL GROUP	N 11	EXPERIMENTAL GROUP
I. COMPLETION		.84		.64
II. EMBELLISHMENT AND DETAIL		1.21		.64
III. MATURITY OF CONCEPT		.68		.64
IV. CONTROL (ADJUSTMENT)		.68		.55

In Table XLI the rate of improvement noted in the two groups at the secondary level indicates greater mean growth in the control group over the experimental period. Part of this may be influenced by the larger N of the control group which would help to absorb individual deviations.

At the primary and intermediate levels the experimental group displays a mean improvement index equal to or greater than that of the control group on the characteristics measured. This pattern is not maintained at the secondary level. The areas showing greater difference between the two groups are Completion and Embellishment and Detail. The emphasis in the experimental group on appropriate materials and more opportunity for individual experimentation would seem to be related to these findings. The lack of this trend at the secondary level might indicate that work habits and patterns were already too well established to be influenced by the experimental procedure. In the other two characteristics, Maturity of Concept and Control, little difference is noted throughout. This seems reasonable since these two areas are more dependent upon maturational factors.

QUESTION 7: DOES THE EXPERIMENTAL PROGRAM IN ART INCREASE THE LEVEL OF SOPHISTICATION IN DESIGN JUDGMENT AS MEASURED BY THE GRAVES DESIGN JUDGMENT TEST?

In the consideration of this question, the means and standard deviations and an analysis of variance of scores on the Graves Design Judgment Test were obtained for pre-and post-test data at each level.

TABLE XLII

MEANS AND STANDARD DEVIATIONS OF SCORES ON THE GRAVES DESIGN JUDGMENT PRE-TEST AND POST-TEST FOR PUPILS AT THE PRIMARY LEVEL

STATISTIC	N	CONTROL GROUP		N	EXPERIMENTAL GROUP	
		PRE-TEST	POST-TEST		PRE-TEST	POST-TEST
$\bar{X}$	17	31.65	28.65	24	28.08	28.63
S		3.55	4.02		4.40	3.28

An examination of the mean and standard deviation scores for the two groups at the primary level (Table XLII) reflects an increase in heterogeneity from the pre-to the post-test for the control group despite the fact that the mean score showed a decrease. An opposite trend is noted for the experimental group which shows a trend toward greater homogeneity on the post-test data. The mean score for this group remains essentially the same.

TABLE XLIII

ANALYSIS OF VARIANCE OF THE PRE-TEST SCORES OF THE GRAVES DESIGN JUDGMENT TEST AT THE PRIMARY LEVEL

Sources of Variation	D. F.	Sum of Sq.	Means Sq.	F
Between Classes	3	170.48	56.83	3.25
Within Classes	37	647.62	17.50	
Total	40	818.10		

The obtained F level (3.25) on the analysis of variance for the primary level pre-test does not reach a significant level of criticalness. The intra-group variation at this level was not significant.

On the post-test analysis (Table XLIV) at the primary level a less critical F ratio was found than that which occurred on the pre-test. The variation within the groups after the experimental procedure is less than previous. It would seem that shifts in both experimental and control groups reflected in Table XLII contribute to this low index of variation. The control group seems to be more divergent while the experimental less so.

The analysis of variance of the Design-Judgment scores for the two groups (Table XLIV) did not reach a significant F level. It is assumed that the intra-group variation at this level is not significant.

TABLE XLIV

ANALYSIS OF VARIANCE OF THE POST-TEST SCORES ON THE GRAVES DESIGN JUDGMENT TEST AT THE PRIMARY LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	29.02	9.67	.71
Within Classes	37	506.49	13.69	
Total	40	535.51		

TABLE XLV

MEANS AND STANDARD DEVIATIONS OF SCORES ON THE GRAVES DESIGN JUDGMENT PRE-TEST AND POST-TEST FOR PUPILS AT THE INTERMEDIATE LEVEL

STATISTIC	N	CONTROL GROUP		N	EXPERIMENTAL GROUP	
		PRE-TEST	POST-TEST		PRE-TEST	POST-TEST
$\bar{X}$	22	28.00	27.64	22	29.45	28.45
S		5.82	7.15		6.10	6.05

Table XLV reflects a somewhat similar pattern for the pre-and post-test mean and standard deviation scores at the intermediate level to that found for the primary group. The control group increased in variability from pre-to post-test while maintaining a fairly consistent mean. The experimental group maintained a relatively consistent deviation pattern and displayed a slight decrease in the mean score.

TABLE XLVI

ANALYSIS OF VARIANCE OF THE PRE-TEST SCORES ON THE GRAVES DESIGN JUDGMENT TEST AT THE INTERMEDIATE LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	67.86	22.62	.61
Within Classes	40	1494.87	37.37	
Total	43	1562.73		

TABLE XLVII

ANALYSIS OF VARIANCE OF THE POST-TEST SCORES ON THE GRAVES DESIGN JUDGMENT TEST AT THE INTERMEDIATE LEVEL

Source of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	88.75	29.58	.61
Within Classes	40	1943.16	48.58	
Total	43	2031.91		

The analysis of variance for both the pre- and post-test Graves Design Judgment scores at the intermediate level (Tables XLVI and XLVII) yields an F ratio well below the required probability level. While there are internal shifts noted by the mean and standard deviation scores (Table XLV), these result in essentially the same inter-group relationships.

TABLE XLVIII

MEANS AND STANDARD DEVIATIONS OF SCORES ON THE GRAVES DESIGN JUDGMENT PRE-TEST AND POST-TEST FOR PUPILS AT THE SECONDARY LEVEL

STATISTIC	N	CONTROL GROUP		N	EXPERIMENTAL GROUP	
		PRE-TEST	POST-TEST		PRE-TEST	POST-TEST
$\bar{X}$	22	27.32	27.09	29	35.00	30.63
σ		8.74	10.59		12.65	11.05

The mean and standard deviation for the two groups show essentially the same pattern at the secondary level as that noted at the two preceding levels. The control group shows an increase in intra-group diversion while the experimental group displays the reverse. The mean scores for the control group are essentially not altered while they decrease for the experimental group.

The analysis of variance of the Design Judgment scores for the two groups (Table XLIX) did not reach a significant F level. It is assumed that the intra-group variation at this level is not significant.

The derivation of a highly significant F on the post-test analysis of the Graves Design Judgment Test at the secondary level indicates a high degree of variation within the population. This represents a substantial increase over the findings on the pre-test comparison. In reflecting these findings along with

TABLE XLIX

ANALYSIS OF VARIANCE OF THE PRE-TEST SCORES ON THE GRAVES DESIGN *JUDGMENT* TEST AT THE SECONDARY LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	1024.06	341.35	3.33
Within Classes	43	4408.72	102.53	
Total	46	5432.78		

TABLE L

ANALYSIS OF VARIANCE OF THE POST-TEST SCORES ON THE GRAVES DESIGN *JUDGMENT* TEST AT THE SECONDARY LEVEL

Sources of Variation	D.F.	Sum of Sq.	Means Sq.	F
Between Classes	3	2641.25	880.42	10.83**
Within Classes	43	3494.07	81.26	
Total	46	6135.32		

** significant at or less than .01 level

the data in Table XLIX it would seem that the variation is contributed to by an increased fluctuation between individuals in the control group, and a decrease in both the pattern and the total scores for the experimental group.

Essentially a very similar pattern is displayed on the results of the Graves Design Judgment Test at all three levels. The control group seems to display a consistent tendency toward greater heterogeneity from pre-test to post-test and the opposite, though a less critical pattern is noted for the experimental group at all three levels. When the analysis of variance was applied to the data, in only one instance did the resultant F reach statistical significance at the .01 level. This tends to indicate that the experimental procedures provided experiences which allowed the students to more consistently expand their activities. The more spontaneous approach to materials and expression would seem to be associated with the achievement of this pattern. In contrast, the greater degree of variation within the control group might suggest an unevenness of experiences.

QUESTION 8: DO DIFFERENCES EXIST IN THE ART PERFORMANCE OF PUPILS IN THE EXPERIMENTAL AND CONTROL GROUPS AS DETERMINED BY A COMPARISON OF ART SAMPLES?

Figures 1 and 2 present a graphical representation of the ranking of art samples of the subjects in each group at the three levels. The art sample index indicates the comparative level of art performance of the project population with the normal population of the same school district.

Comments on this data will be restricted to inspection of the ratings since the data did not lend itself to more formal statistical treatment.

In individual cases within the primary control group advanced placement on the index is noted on the post-test samples. (Figure 2). A departure from the more homogeneous structure of the control group is also caused by these cases.

For the experimental group at the primary level a relatively heterogeneous pattern is noted at both pre-and post-test periods. (Figures 1 and 2). More mature ratings are achieved by a greater portion of the population.

In comparing the control and experimental groups at the primary level, more individuals in the experimental group achieved placement in the second grade scale at both test periods than did the control. The over-all amount of individual growth in most cases seems to be greater in the experimental group. In addition, the experimental group as a whole displayed a more consistent pattern.

At the intermediate level, the control group ranged from the kindergarten to within the fifth grade scale on the art sample index (Figures 3 and 4). The bulk of the group fell within the second grade placement on the index. They were relatively homogeneous in their grouping. The post-test displays a more divergent pattern. Here again, the scores ranged from kindergarten to fifth grade placement. A considerable number (11) attained a lower placement than on the pre-test. Growth for the others was at about the same ratio as decline for the afore-mentioned.

For the experimental group at the intermediate level, the pre-test samples ranged from kindergarten to the fifth grade placement (Figure 3). The placement pattern is essentially similar to the pre-test for the control group.

On the post-test (Figure 4) the experimental group ranged from the kindergarten to the seventh grade level in most instances. This represents a substan-

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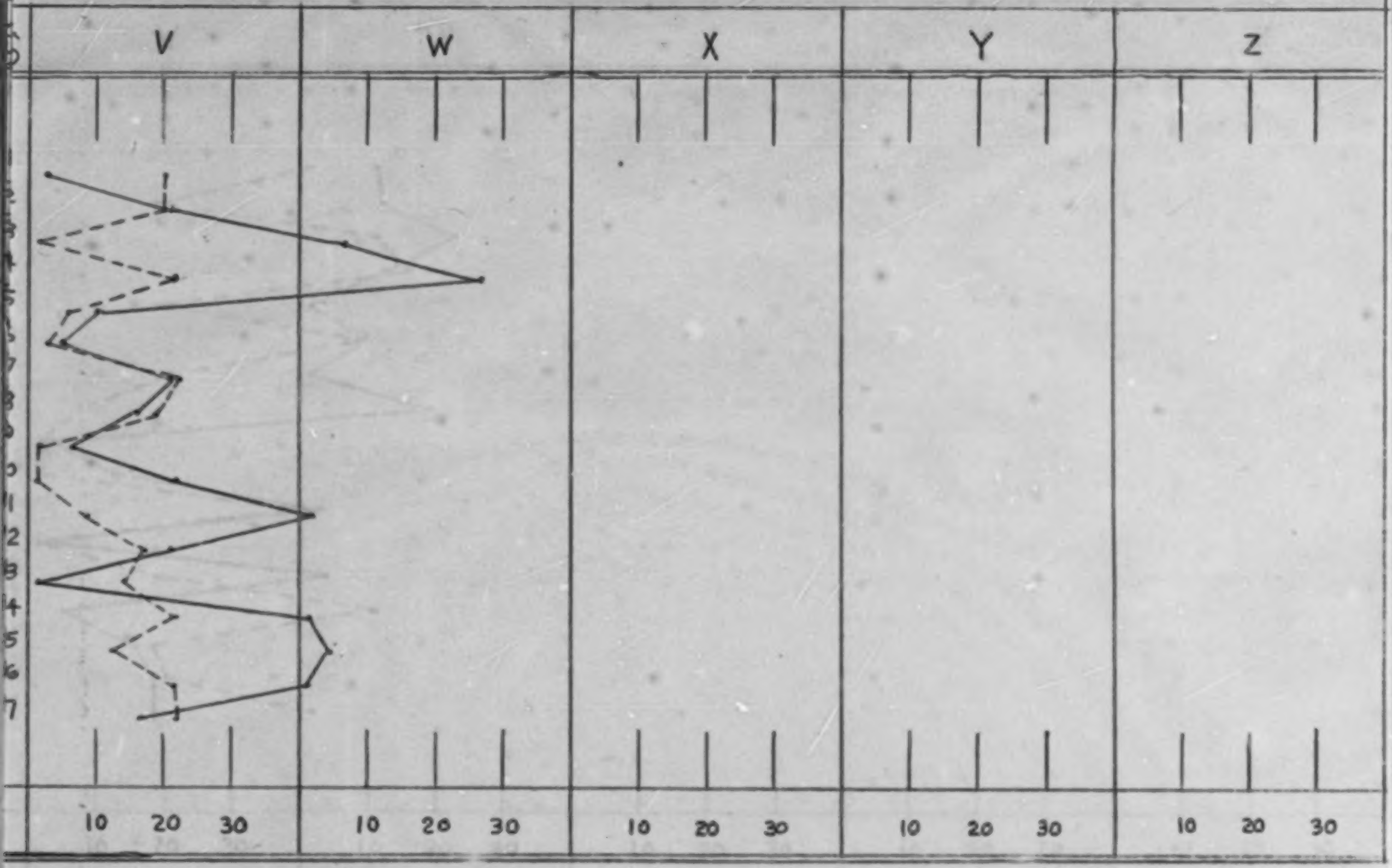
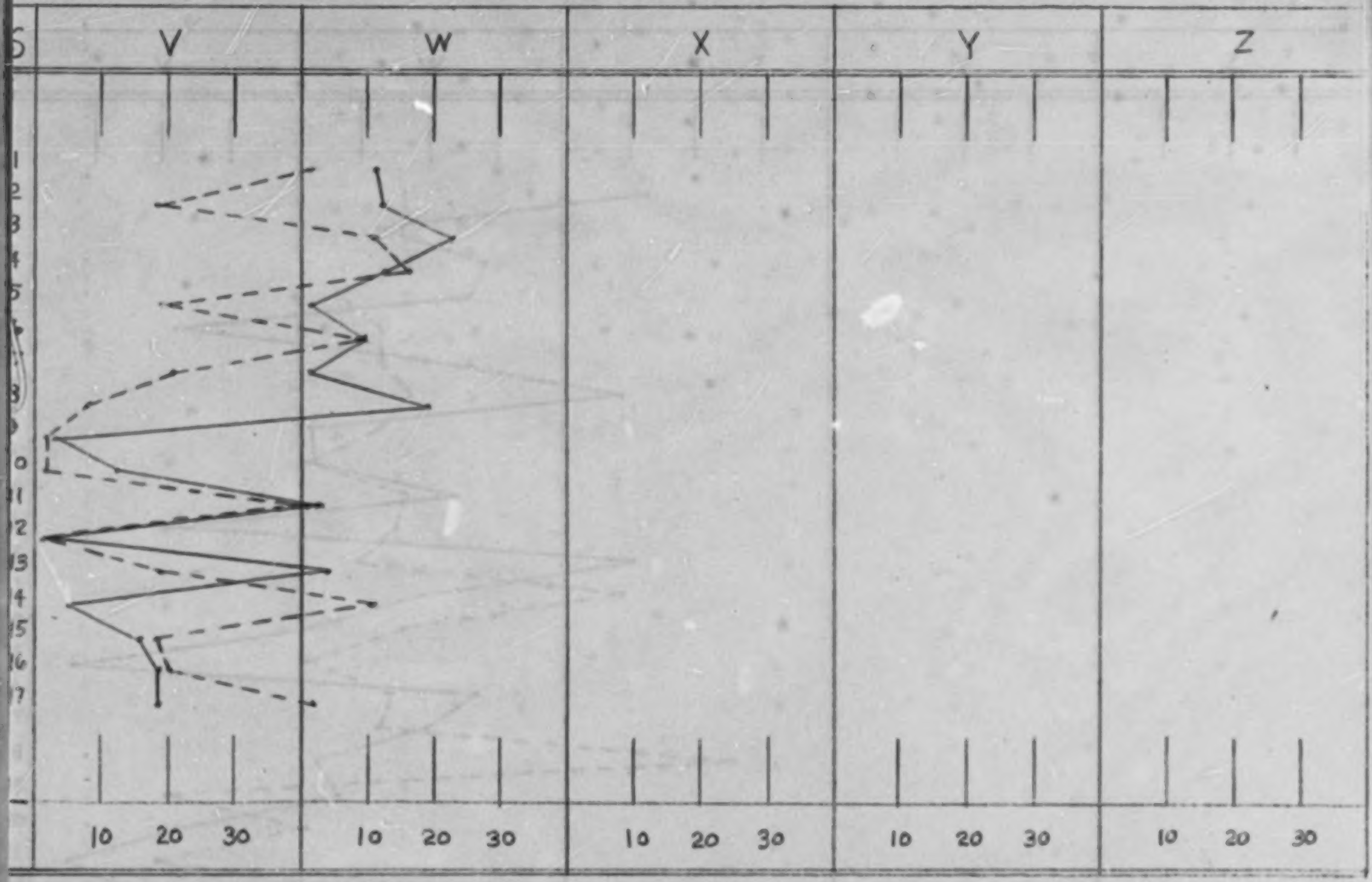
Figure # 1 Art Sample Index of Students on Pre-and Post-Evaluation in the Control Group at the Primary Level.



Control Pre-Evaluation ----
Control Post-Evaluation ____

Key
V - Kindergarten
W - Grade 2
X - Grade 5
Y - Grade 7
Z - Grade 8

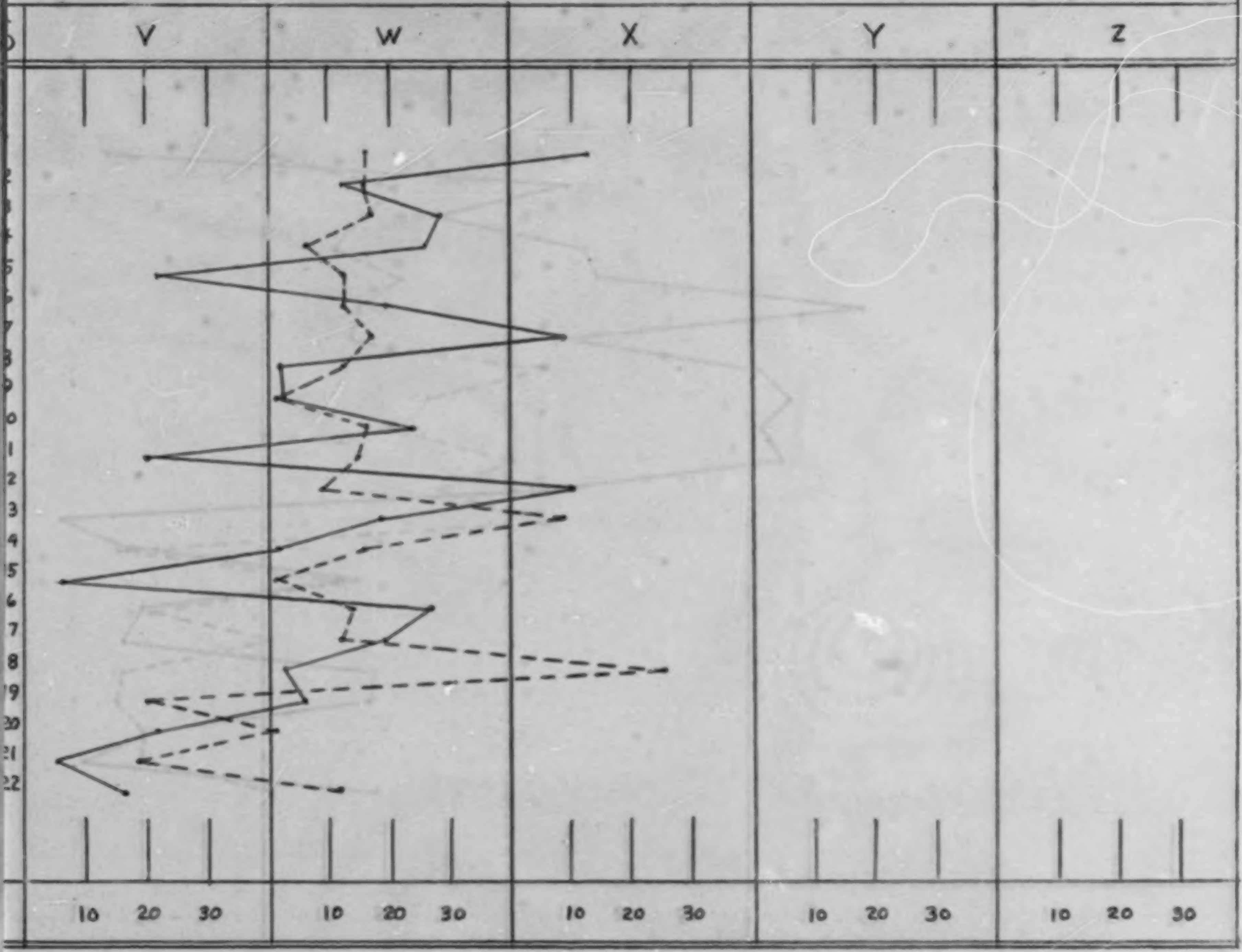
Figure # 2 Art Sample Index of Students on Pre and Post-Evaluation in the Experimental Group at the Primary Level.



Experimental Pre-test ----
Experimental Post-test____

Key
V - Kindergarten
W - Grade 2
X - Grade 5
Y - Grade 7
Z - Grade 8

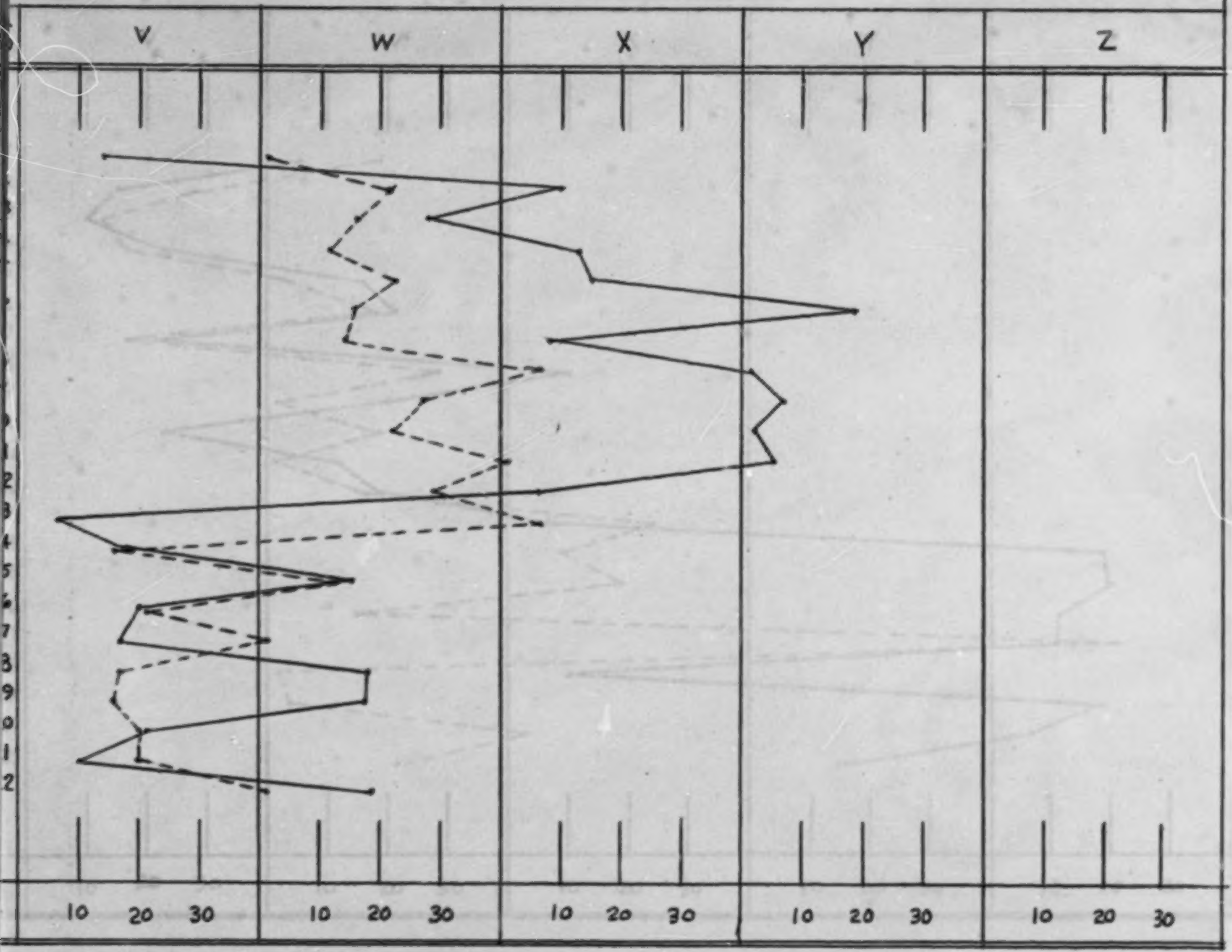
Figure # 3 Art Sample Index of Students on Pre-and Post-Evaluations in the Control Group at the Intermediate Level.



Control Pre-Evaluation ----
Control Post-Evaluation ____

Key
V - Kindergarten
W - Grade 2
X - Grade 5
Y - Grade 7
Z - Grade 8

Figure # 4 Art Sample Index of Students on Pre-and Post-Evaluation in the Experimental Group at the Intermediate Level.



Experimental Pre-Evaluation ----
Experimental Post-Evaluation ____

Key
V - Kindergarten
W - Grade 2
X - Grade 5
Y - Grade 7
Z - Grade 8

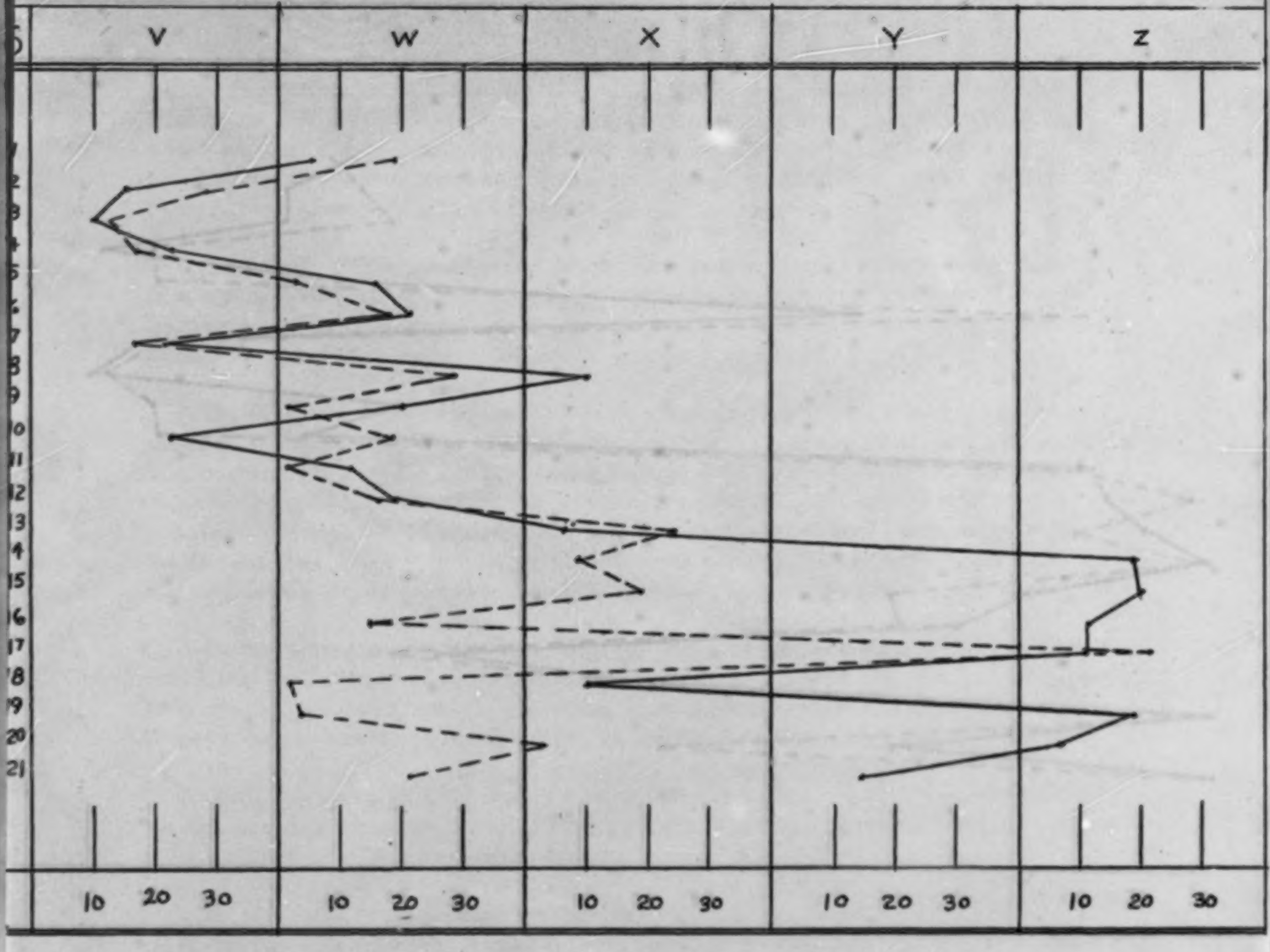
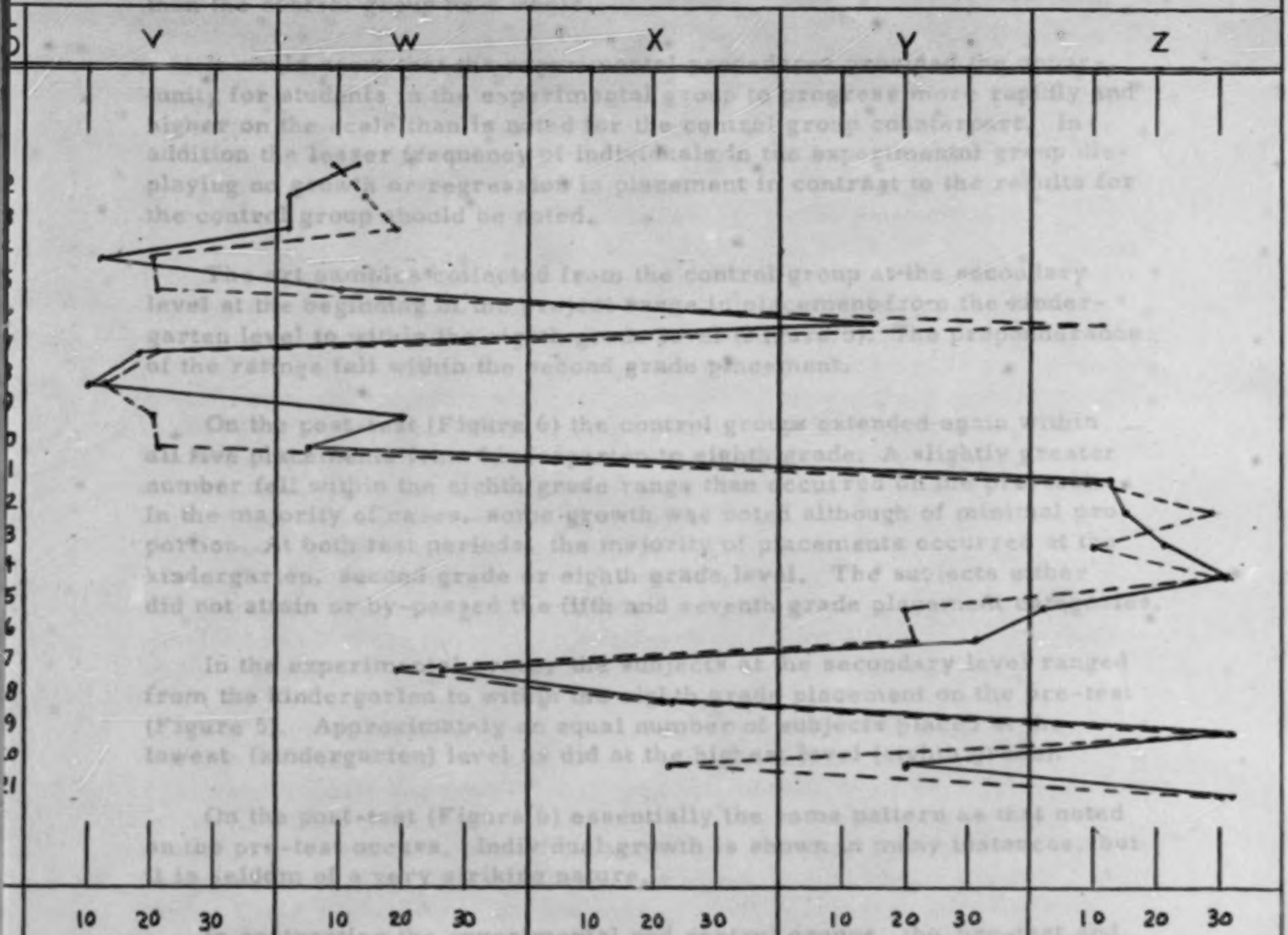


Figure # 5 Art Sample Index of Students on Pre-and Post Evaluation in the Control Group at the Secondary Level.

Control Pre-Evaluation ----
Control Post-Evaluation ____

Key
V - Kindergarten
W - Grade 2
X - Grade 5
Y - Grade 7
Z - Grade 8

Figure #6 Art Sample Index of Students on Pre-and Post-Evaluation in the Experimental Group at the Secondary Level.



Experimental Pre-Evaluation ----
Experimental Post-Evaluation ——

Key
V - Kindergarten
W - Grade 2
X - Grade 5
Y - Grade 7
Z - Grade 8

tial gain over the pre-test placement.

On contrasting the two groups, the experimental group seems to have shown more cases of gain and greater gain than does the control group. The final placement positions of the experimental group are more advanced than the control group as a whole.

It would seem that the experimental procedures provided the opportunity for students in the experimental group to progress more rapidly and higher on the scale than is noted for the control group counterpart. In addition the lesser frequency of individuals in the experimental group displaying no growth or regression in placement in contrast to the results for the control group should be noted.

The art samples collected from the control group at the secondary level at the beginning of the project range in placement from the kindergarten level to within the eighth grade level (Figure 5). The preponderance of the ratings fall within the second grade placement.

On the post-test (Figure 6) the control groups extended again within all five placements from kindergarten to eighth grade. A slightly greater number fell within the eighth grade range than occurred on the pre-test. In the majority of cases, some growth was noted although of minimal proportion. At both test periods, the majority of placements occurred at the kindergarten, second grade or eighth grade level. The subjects either did not attain or by-passed the fifth and seventh grade placement categories.

In the experimental group, the subjects at the secondary level ranged from the kindergarten to within the eighth grade placement on the pre-test (Figure 5). Approximately an equal number of subjects placed at the lowest (kindergarten) level as did at the highest level (eighth grade).

On the post-test (Figure 6) essentially the same pattern as that noted on the pre-test occurs. Individual growth is shown in many instances, but it is seldom of a very striking nature.

In contrasting the experimental and control groups, the pre-test and post-test patterns of the experimental group is more consistent and has a higher incidence of placement at the upper ranges. As was noted for the control group, the experimental group also displays a tendency for either very low or very high placement. Very few fall within the fifth and seventh grade level. The experimental procedure would seem to have furthered the development of maturation levels already partially achieved prior to the initiation of the project.

QUESTION 9: WHAT CHARACTERISTICS ARE PRESENT IN THE ART ACTIVITIES PREFERRED BY THE PUPILS AS MEASURED BY THE ART EVALUATION CONFERENCE?

The information obtained by the Art Evaluation Conference at the completion of each project is summarized in the following tables according to experimental and control groups at the three levels. Total frequencies and the means for each of the items included within the response categories are presented for each level.

Table LI presents the frequencies and the means for each of the category sub-items related to the pupils' evaluation of the art activities performed by the control and experimental groups at the primary level.

An examination of the pattern for the experimental group shows a more individualized and unique utilization of materials and products in contrast to the more traditional. The control group follows generally the more usual pattern of material interest and usage that is found reported in the literature. Specifically, the experimental group seemed to pursue their own interests in choosing materials, techniques and deciding on the utilization of the completed product. They were less concerned with group reaction and with the specific concrete utilization of the completed project than the control group. It would seem that the goals of the experimental procedure are related to the somewhat contrasting outcomes.

Table LII presents the frequencies and means for each of the category sub-items related to the pupils' evaluation of the art activities performed by the control and experimental groups at the intermediate level.

The experimental group at this level shows a somewhat diverse pattern of their reaction to the various art activities. A preference for involvement in the use of tools and materials in experimentation is noted. The utilization of the finished product seems to relate more to the individual in either a practical or aesthetic nature rather than to display or decoration in a less personalized realm. The control group shows a somewhat contrasting pattern. Their evaluation of the finished product is in a less personalized framework. They seem to indicate a much greater desire and satisfaction in displaying their product and having it utilized by others than themselves. An interesting area of contrast in the evaluation is the indication that the experimental segment would choose to enlarge art objects. This indication was appreciably less frequent in the control group.

Because of the inability to obtain a complete set of the data from the Art Evaluation Conference at the secondary level, no presentation of the data or discussion of it can be made.

TABLE LI

FREQUENCIES AND MEANS FOR THE CATEGORY ITEMS OF THE ART EVALUATION CONFERENCE FOR THE PRIMARY LEVEL

Category	Experimental Total	Experimental Mean	Control Total	Control Mean
I. Chose to make this because:				
1. pretty	59	3.11	70	3.04
2. useful	58	3.05	18	.78
3. tactile	108	5.68	114	4.96
II. From making this I learned:				
1. new material	93	4.89	123	5.35
2. new tool	29	1.53	23	1.00
3. finished product	59	3.11	52	2.26
4. other	55	2.89	19	.83
III. Color preferred because:				
1. bright	49	3.06	55	2.89
2. dark	31	1.94	16	.84
3. vari-colored	68	4.25	82	4.32
4. other	49	3.06	28	1.47
IV. Used as:				
1. gift	42	2.21	23	1.00
2. wear	2	.11	2	.086
3. decorate school	48	2.53	93	4.04
4. decorate home	80	4.21	97	4.22
5. other	44	2.32	5	.21
V. Enjoyed most:				
1. planning	28	1.47	14	.61
2. experimenting	92	4.84	126	5.48
3. using tools	17	.89	8	.35
4. showing objects	79	4.16	70	3.04
VI. Change if made another:				
1. smaller	29	1.53	39	1.70
2. larger	73	3.84	82	3.57
3. more parts	49	2.58	46	2.00
4. other changes	59	3.11	25	1.09

TABLE LII

FREQUENCIES AND MEANS FOR THE CATEGORY ITEMS OF THE ART EVALUATION CONFERENCE FOR THE INTERMEDIATE LEVEL

Category	Experimental		Control	
	Total	Mean	Total	Mean
I. Chose to make this because				
1. pretty	95	4.52	95	4.75
2. useful	109	5.19	94	4.70
3. tactile	30	1.43	39	1.95
II. From making this I learned:				
1. new material	94	4.48	57	2.85
2. new tool	50	2.38	19	.95
3. finished product	49	2.33	115	5.75
4. other	42	2.00	23	1.15
III. Color preferred because:				
1. bright	55	2.62	47	2.47
2. dark	39	1.86	17	.89
3. vari-colored	93	4.43	144	7.58
4. other	38	1.81	8	.42
IV. Used as:				
1. gift	69	3.29	41	2.05
2. wear	20	.95	8	.40
3. decorate school	69	3.29	113	5.65
4. decorate home	73	3.48	80	4.00
5. other	18	.86	15	.75
V. Enjoyed most:				
1. planning	60	2.86	62	3.10
2. experimenting	78	3.71	46	2.30
3. using tools	34	1.62	14	.70
4. showing objects	55	2.62	104	5.20
VI. Change if made another:				
1. smaller	22	1.05	20	1.05
2. larger	128	6.10	60	3.16
3. more parts	21	1.00	33	1.74
4. other changes	62	2.95	78	4.10

The pattern noted at both the primary and intermediate level seems to indicate a perception and a response to the experimental approach on a number of items. The experimental group chooses more individualized avenues of approach to both their work and their evaluation of it. The intermediate level seems to recognize and appreciate the opportunity to experiment and pursue individual interest more than the primary group. It would seem likely that this is partly a function of both social and physiological maturation. The most interesting facet of this particular comparison would seem to be the refreshing recognition on the part of a large portion of the experimental group of the presence of both the means and the climate to pursue more individual interests and goals.

CHAPTER IV

SUMMARY AND CONCLUSIONS

In the past art programs for intellectually handicapped children have been essentially the same as the art curriculum provided for pupils at the various grade levels within the regular school program. As the result of an informal pilot study it seemed possible that the learning effects of an art program especially adapted to meet the needs and characteristics of retarded children would have greater effect on both their art behavior and certain elements of personal and academic behavior. The purpose of this study was to further explore these general hypotheses. Specifically the phases being investigated included:

1. whether an experimental art program would significantly modify motor skills, academic achievement and social behavior of intellectually handicapped pupils;
2. whether an experimental art program would modify certain aspects of art behavior in intellectually handicapped pupils; and
3. whether it would be possible to identify the preferences of intellectually handicapped pupils for certain art activities and related teaching procedures.

In order to facilitate the examination and interpretation of the statistical analyses of the various sections of these hypotheses, the following specific questions have been developed.

1. Does the experimental program in art affect the academic progress of pupils as measured by the CALIFORNIA ACHIEVEMENT TEST?
2. Is there a relationship between the experimental program in art and motor coordination as determined by the MOTOR COORDINATION APPRAISAL?
3. Do differences exist between experimental and control groups in general behavior as measured by the PROPOSED RATING SCHEDULE FOR CLASSES OF EXCEPTIONAL CHILDREN?
4. Do differences exist between the experimental and control groups in art behavior as measured by the ART BEHAVIOR RATING SCALE?

5. Does the pupils' interest in art become affected by the experimental art program as measured by the ART INTEREST INVENTORY?

6. Is the creativity of pupils in art affected by the experimental program as measured by the WARTEGG TEST?

7. Does the experimental program in art increase the level of sophistication in design judgment as measured by the GRAVES DESIGN JUDGMENT TEST?

8. Do differences exist in the art performance of pupils in the experimental and control groups as determined by a comparison of ART SAMPLES?

9. What characteristics are present in the art activities preferred by the pupils as measured by the ART EVALUATION CONFERENCE?

A number of standardized and non-standardized measures were employed in the collection of the data. Included were the California Achievement Test, Motor Coordination Appraisal, Proposed Rating Schedule for Classes of Exceptional Children, Art Behavior Rating Scale, Art Interest Inventory, Wartegg Test, Graves Design Judgment Test, Art Evaluation Conference and a scale for the Comparison of Art Samples. Where appropriate each of the measures were administered to the subjects in both the experimental and control groups prior to and at the completion of the project period. The actual project period extended throughout the 1960-61 school year.

The project population consisted of 165 educable mentally retarded and slow-learning pupils enrolled in the public schools of Arlington County, Virginia. The chronological age range of the population was from six years one month to eighteen years nine months. The mental age range was from four years to thirteen years four months. The pupils were members of classes in buildings appropriate to their chronological age level. The project population was divided by class groups so that an equal number of subjects would receive the experimental procedures or the control treatment at each of the three levels: primary, intermediate and secondary. Two classes at each level were included in each of the experimental and control designations. A total of twelve classes constituted the study population.

Statistical analyses of the data were performed according to experimental and control group designation, pre-and post-test periods, and at the three placement levels.

Prior to the initiation of the project, the art experiences of the subjects had been relatively equivalent. For the purposes of the study, the classes assigned to the control group continued in the usual program of art instruction offered at their level. The teachers of the experimental classes were oriented in special techniques and provided with materials which seemed consistent with the goals established and indicated in the pilot study[2]. Each of the class groups completed fifteen art activities using the appropriate methods and materials according to the control or experimental designation.

Comparisons of the achievement test scores indicate a somewhat different pattern depending upon the level. The experimental procedure would seem to have a greater effect at the primary level in the arithmetic and language areas. In both instances the experimental group shows significantly greater growth on the post-test analysis. These patterns are not evident at the intermediate and secondary level. In fact, examination would suggest that the experimental procedure at these levels may have contributed to the homogeneity of the group on achievement measures. The relative immaturity and lack of previously established academic patterns may account for the greater susceptibility of the primary group.

On the measures of motor coordination, the primary group again shows the greater shift toward growth in the experimental section. The secondary level also displays a greater amount of growth from pre-to post-test for the experimental section. This is in contrast to a lesser rate for the control. While both the primary and secondary levels exhibit different rates and patterns of growth in motor skills than does the intermediate group, they also exhibit differences among themselves. The discrepancy between the experimental and control groups at the primary level seems to be essentially in rate of growth. At the secondary level the essential differentiating characteristic seems to be in terms of a horizontal and more qualitative type of development.

According to the measures of general behavior the experimental procedures appear to have been more effective at the primary and intermediate age levels. The more critical effect seems to have occurred at the primary level. This diminishes somewhat at the intermediate level and the trend continues at the secondary where significant differences between the two groups no longer exist. Here again, maturational factors associated with the early establishment of behavioral patterns seem to be responsible for the varying degrees of growth. It must also be noted that individual variation continues to exist on all measures.

In the consideration of the art behavior and attitudes of the subjects concerning the art projects, the secondary experimental group deviates more from the typical pattern than the control group. No such differences are apparent at the primary level or on the examination of the combined data for the three levels. The tendency for the older group to respond more to the characteristics of the experimental procedures may be due to their greater social awareness, their greater ability to perceive a total situation involving both the process and the product, and their more advanced motor development. The general immaturity of the young group in any or all of these areas would account for their non-differentiating behavior.

While no specific attempt was made to relate the individual teacher's characteristics or techniques to the effectiveness of the program, information obtained through the Art Interest Inventory seems relevant. At only one level, the intermediate, is there a significant differentiation between pupil response to the art teacher and teachers of other subjects. The responses obtained at the end of the project indicate greater differences. Whether this is due to facets of the program or to the personality of the teacher cannot be fully determined. However, since this is a shift from the pre-test, it would seem reasonable that this is related to the experimental procedures.

An examination of each teacher's lesson description elicited by the Characteristics of the Teaching Process substantiates this observation. The teachers in both control and experimental groups seem to utilize similar general techniques for motivation, work situations, and other generalized aspects of the teaching process. Individual modifications seem more apparent in the relationship of materials used and choice of activities. This was also evident in the increased use of similar materials by the teacher of the special classroom in all areas of curriculum. This pattern is relatively consistent throughout the three levels. It also seems to indicate that the teachers approached the children as individuals. Modifications were incorporated within their specific practices although they were not apparent in the more generalized aspects.

According to the measures concerned with creativity the primary and intermediate level comparisons both indicated appreciably greater ratings for at least one characteristic in favor of the experimental group. At the primary level, the differentiation was most prominent for Embellishment and Detail. At the intermediate level, Completion was most outstanding in favor of the experimental group. This would seem to reflect a more individualized approach presenting opportunities for completion according to the child's choice. At the secondary level, an opposite tendency was noted for the same characteristics. This would seem to reflect an already established pattern. Attempts at modification may have brought about some conflict thus resulting in the lower indices for the experimental group. Here again, the implications for early identification of the retardate and associated modification of educational treatment seems to be indicated.

On measures of design judgment a similar, though consistently heterogeneous pattern, was noted at all three levels. For the most part the control group displays an increased variation from pre-to post-test while the experimental group displays the opposite. When the two groups are contrasted, this pattern of greater individuality on the pre-test is noted at the primary level. At the intermediate level, the balance of the relationship between the two groups changes in terms of qualitative aspects although resulting in a similar quantitative relationship. At the secondary level the opposite pattern to that noted at the primary level occurs. The pattern reflected in these findings would seem to be the result of a less refined rationale for the primary level respondents. It is no doubt accompanied by a factor noted in other comparisons. The primary group is understandably limited in past patterns and experiences which might provide the framework for their receptivity. The secondary group reflects the opposite in that they seemed to have already integrated patterns of response.

An examination of the art samples of the subjects indicates a greater increase in the level of the production from pre-test to post-test within the experimental group than within the control group. The primary and intermediate levels again show more individual growth in more cases than does the secondary level. The experimental art procedures seem to have provided the opportunity for more individual growth in art over the project period than in the control classes.

When the pupils were asked to indicate their reactions to specific lessons at their completion, those who were assigned to the experimental program reacted favorably to the opportunity for more individualized approaches and utilization of specialized materials. This pattern was not apparent in the control group. In addition, the experimental subjects seemed to express a greater self-orientation in that they were less concerned with group values and specific utilization of a product. While this is apparent at both the primary and intermediate levels, it is more predominant at the intermediate.

Additional information derived from the Parent Interview Questionnaire coincides with implications drawn from the experimental findings. At all three levels an increase in the number of times parents report favorable school comments for the experimental group pupils is noted at the end of the project period. This pattern is not maintained for the control group. There also is a general tendency for a maintenance or an increase in the number of times art class is specifically mentioned in the parent's report of school subjects referred to at home. This is a more consistent pattern than that noted for other courses or subjects within the curriculum at any of the three levels.

The general pattern derived from the data indicates that the experimental program is consistently more effective in altering characteristics of behavior with the younger children. This trend is noted for academic achievement, motor skills and measures of social behavior. The same pattern is also reflected on the measures related to aspects of art behavior. It seems that once a developmental level related to the more formalized learning experiences is reached, modifications in attitude, practices and materials can be effected in a number of related areas. On the other hand, as evidenced by a lesser degree of differentiation at the secondary level, there seems to be a range of development beyond which alteration or a shift in emphasis has minimal effect. In fact, an attempt to alter basic patterns of performance at this level seems to have a disturbing effect and may result in a suspension of the growth curve. While this project did not extend long enough to further explore this occurrence, it would seem likely that this would be of a temporary nature provided consistency exists within the program.

In general, the techniques and materials initiated with the experimental group seemed to have had a positive, although not always statistically significant, effect. It would seem that certain characteristics of these procedures and activities warrant identification. The data available supplies a partial indication of these factors. An exposure to a total activity, before becoming involved in specific aspects of it, seems to result in more effective and consistent completion of a project. In addition, emphasis upon the personal experiences involved within the art activity seems to be related to a more diverse and individualized response to the activity. In this way, the individual has the opportunity for concentration on the creative aspects such as embellishment of design, color experimentation, as well as the enjoyment of these processes in contrast to emphasis more solely on the completed object. A major factor in relation to appropriate art activities seems to be related to facets of maturation within a developmental range. Therefore curriculum modifications would seem to be more effective and more beneficial when initiated at an early period. The techniques, materials, general attitude and climate seem to be also essential. These observations are borne out by the examination of the data relating to the pupils' art performance as well as their own reactions to the program. Thus, it would seem that the experimental art program with concentration on the utilization of resist materials and resulting in three dimensional products is positively related to behavior in a number of areas.

While it was not a part of the project design and not intended nor possible to be objectively evaluated, the influence upon the special education program in the community as a result of the involvement with the study should be noted. It is hoped that a reflection of the research study in classroom curricular practices will continue to appear after the termination of the formal aspects of the study. It is impossible to estimate the effect of the project year on the personnel involved in the study. It is agreed that without a planned study, the cohesive atmosphere attained throughout the experiment would not have been achieved.

The findings of this study represent a preliminary investigation of the factors associated with art behavior and related aspects for intellectually handicapped pupils. Generalizations regarding the findings are limited to the conditions of this study. Additional research on these and related aspects are sorely needed as a basis for a realistic reappraisal of art curricula for children with intellectual limitations.

BIBLIOGRAPHY

1. Arje, Frances B., "The Fine Arts as an Adjustment to Rehabilitation", Journal of Rehabilitation, Vol. XXVI, No. 6, (1960), p. 28.

2. Arlington County Public Schools, Arlington, Virginia, "Art Activities for Mentally Handicapped Children", Unpublished Manuscript, (1958).

3. Chapman, Frederick, M., Recreation Activities for the Handicapped, New York: Ronald, (1960)

4. Dixon, Wilfred J. and Massey, Frank J., Jr., Introduction to Statistical Analysis, Second Edition, McGraw-Hill, (1957).

5. Goodenough, Florence, Exceptional Children, New York: Appleton Century Crafts, (1956).

6. Goodenough, Florence, Measurement of Intelligence by Drawings, Yonkers-on-Hudson, New York: World (1926).

7. Hausman, Jerome J., "Graphic and Plastic Arts", Review of Educational Research, Vol. XXVIII, No. 2, (1958), pp. 169-179.

8. Illinois Department of Public Instruction, The Curriculum Guide for Mentally Handicapped, Springfield: Dept. of Public Instruction, (1960).

9. Kirk, Samuel and Johnson, G. Orville, Educating the Retarded Child, Cambridge, Mass.: Houghton Mifflin, (1951).

10. Larkin, Marie, A Study to Determine Some of the Possible Effects of Resist Materials on the Maladjustive Processes of Mentally Retarded Children, New York: Columbia University, Unpublished Doctoral Dissertation, (1955).

11. Logan, Frederik M., "Fine Arts", Review of Educational Research, Vol. XXV, No. 2, (1955) p. 181.

12. Phillips, E. Lakin, "Proposed Rating Scale for Classes of Exceptional Children", Washington, D. C.: Unpublished Manuscript (1958).

13. Ray, William S., An Introduction to Experimental Design, New York: MacMillan, (1960).

14. Riedel, Erich, Gedanken, Erfahrungen und Anregungen zum Wirkunterrich in der Hilfschule, (April, 1945).

BIBLIOGRAPHY-- Continued

15. Schaefer-Simmern, Henry, The Unfolding of Artistic Activity, Berkeley: University of California Press, (1943).

16. Schaefer-Simmern, Henry, The Unfolding of Artistic Activity, Berkeley: University of California Press, (1948).

17. Tate, Merle W., and Clelland, Richard C., Nonparametric and Shortcut Statistics, Bloomington, Illinois: Interstate, (1957).

18. Tobias, Jack and Gorelick, Jack, "The Utility of the Goodenough Scale in the Appraisal of Retarded Adults", American Journal of Mental Deficiency, Vol. 65, No. 1, (1960) pp. 64-68.

19. Wallin, J. E. W., The Education of Handicapped Children, Boston: Houghton Mifflin, (1924).

20. Warner, W. Lloyd, Meeker, Marcia and Eells, Kenneth, Social Class in America, City of Chicago: Science Research Associates, (1949).

21. Wiggin, Richard G., "Art Activities for Mentally Handicapped Children", Journal of Educational Research, (March, 1961). Vol. 54, No. 7, pp. 251-259.

APPENDIX A

SUCCESSFUL ART ACTIVITIES FOR MENTALLY HANDICAPPED PUPILS OF PRIMARY, INTERMEDIATE AND SECONDARY LEVELS AS DETERMINED BY THE COOPERATIVE RESEARCH PROJECT REPORTED HEREIN

The following set of lesson outlines were selected by the art specialist on the project team as samples of the activities carried out in the experimental program. A number of the descriptions are accompanied by illustrations of the art product involved.

COILED CLAY BOWLS

for primary level pupils

Materials:

soft clay
newspaper (to spread on desk)
water pans
tongue depressors (to smooth edges and faces)
rolling pins (to roll out clay slabs for base)
tempera paint and brushes

Motivation: Show students finished bowls. Ask them to figure out how they could be made.

Procedure: Place newspaper in front of each child. Give each child about one pound of clay in ball form. Show them how to pound it and work out air bubbles. Then demonstrate how clay slab is rolled out for the base, and coils are made by rolling out with fingers. Follow-up with a showing of how clay coils are joined to base and to each other, as side walls are built up. Children will need individual help with both slab rolling and coil making.

After bowls are finished and thoroughly dried, they can be painted with tempera paint and finished with shellac.

Comments: Clay bowls, using the coil method, remains one of the best activities for this level. Some of the obvious reasons are:

- each process, such as rolling the slab, rolling out coils, and fitting them together, is a familiar "home" activity which is soothing and repetitious,
- the completed work has solidity and utility,
- each step in the building process can be clearly seen, and the moment-to-moment progress measured visually.

WOOD BLOCK SCULPTURE

for primary level pupils

Materials:	scrap wood blocks (from lumber yard) pre-formed wood blocks (bought in toy store in sack form) white glue brushes paint sandpaper
Motivation:	Hold up one block. Ask children what it might be. Now combine it with a second and third block. "What is it now?" Show them how blocks, when combined can look "pretty."
Procedure:	Group children in groups of four. Place an assorted sampling of blocks in the center of each group, with sandpaper and glue. Encourage them to "play with them" and see what they can build that "looks pleasing." After each child has a satisfactory composition, give them a demonstration on sanding and gluing the blocks. After this the children can complete their sculptures and paint them.
Comments:	This project became one of the most successful ones we discovered. Our impression is that the project did completely involve each child because: - blocks, and the resultant shape of the whole sculpture, could be changed at will, - the final composition could be glued with minimum demand on skill or physical effort, - the sanding motions were soothing, yet fully occupied the child's mind and body, - the resultant composition was three-dimensional, colorful and had a "look" of permanency.

SPACE STABILES

for primary level pupils

Materials:

- assorted buttons
- pins
- glue
- assorted seeds
- spools
- scissors
- corrugated colored paper
- celotex scraps (12" square)
- 1/4"x 1/4" balsa wood strips
- colored yarn scraps
- scrap cloth pieces
- colored paper scraps

Motivation: Hold a discussion with the children concerning what it will probably be like some day when we inhabit the moon. Let's assume that we may some day build cities on the moon. What do you suppose our houses will look like? Can you imagine them? After you have given the children plenty of opportunity to imagine what the shape of their moon house will look like, place a box containing a random sampling of scrap materials in the center of a group of four children.

Procedure: Now show the children how they can make their space stabiles stand on the piece of celotex each one has. Show them how sticks can be inserted in the holes. Ask them how pieces can be glued on to the base. Talk briefly about how yarn can be stretched between sticks to give the impression of a wall or roof. Then encourage them to go ahead and construct their own. Some individual help in holding the parts of the stabile together will probably be needed. In the process, they will learn something about how shapes can be made stronger by turning them into triangles or pyramids and how they can be held up by diagonal bracing or yarn. Encourage them to consider the whole surface of the celotex as a decorative feature, as well as the "floor" of the house.

Comments: Since the space stabile is a three-dimensional project children will be enthusiastic about constructing it. They will do a great deal of imagining about what goes on inside their houses. They may even envision very unusual lighting systems and imagine spotlights placed outside the house to illuminate the whole area around. Although this project does not have the utility which our study has shown is preferable, we feel we have found that children still become extremely enthusiastic about it, since it provides such a stimulating vehicle for the free rein of imagination.

FELT PUPPETS

for primary level pupils

Materials:	scraps of colored felt stapler glue scissors
Motivation:	Show examples of felt puppets. Discuss their construction, paying particular attention to the fact that the puppet is like a glove, with a front and a back.
Procedure:	Demonstrate how the front and back pieces can be stapled around the edge, and all features glued or stapled onto the front. Emphasize, in particular, that the person the child chooses should be characterized. "What is there about a policeman that makes him look completely different from all other helpers? Is it the color of his uniform, its shape, the buttons, belt, etc?"
Comments:	The children may need help in cutting the outside shape of the figure, since they must be helped to see that the figure should be "fat" enough so that their hand can be fitted inside, and the fingers inserted in the head and arms.

PAPER BAG PUPPETS
for primary level pupils

Materials:

- paper bags
- felt scraps
- newspaper
- paste
- scissors
- string

Motivation:

Hold up a bag stuffed with paper, and ask class what it could be. Allow time for much imagining. They may say: "It could be a doll...a cowboy...a girl...a policeman...etc." "Would you like to make the person you think it is? Then watch me and I'll show you how."

Procedure:

See that each child has in front of him a paper bag, newspaper and string. Show them how you stuff the bag with newspaper and have them do it at the same time. Proceed with the tying. (They will need individual help with this.)

When they are ready to decorate their people, with facial features, clothes, hair, etc., have them stop work and talk about how they will do this. "You want hair? How can you make it?... What different ways can you make eyes?...How can you put clothes on him?"

Comments:

Invariably these children love their puppets. They want to "show" them and play with them. Sometimes you may see opportunities either to:

-display them in an appropriate setting in the room, or

-have the children actually use them in a spontaneously derived puppet show.

CLAY TRAYS

for intermediate or primary level pupils

Materials: wet clay
newspaper
rolling pins
tongue depressors (to cut clay)
two 1/4" thick sticks
evergreen sprigs

Motivation: Show samples of completed trays. Follow up with a demonstration of:

- -slab rolling (using two 1/4" thick sticks and roller to roll out a ball of clay into a slab).
- -edge fluting (showing how the edges can be bent up with the fingers).

Procedure: Pass out to each student a one pound ball of clay. Have tools located nearby. Some will need much help with the rolling of this slab. Afterwards, when they have bent up the sides of the slab, they can arrange evergreen sprigs on the flat center portion, press in, and remove. Follow up with a demonstration of sample glazing operation and encourage each student to glaze his piece. Then fire them.

Comment: This activity is always popular because:

- -with adequate teacher demonstrations of the technical phases, the student operations are simple,
- -the project can be successfully completed by everyone,
- -the piece looks "professional" and has a sense of permanency and utility.

COPPER REPOUSSE OVER BOXES

for intermediate level pupils

Materials:

copper foil
pre-formed boxes (bought commercially)
varnish stain
wax
wood tools (pencil, orange stick)

Motivation:

Show examples of boxes, finished and with decorated copper foil rectangles nailed or glued to covers. Discuss with class how they are made.

Procedure:

To make a design, encourage each child first to experiment with a small piece of copper foil. Have him place it on a pad of newspapers and arbitrarily "draw" a doodle on the copper, using a blunt-nosed wooden tool sharp enough to make a good indentation in the copper. Then instruct them to make a texture, such as pebbly, prickly, cross-hatched, in at least two or three of the shapes created by the continuous doodle line. Then create a second and third texture and repeat them in selected areas.

With this experience behind them, they will be ready to make the final design. Have them again "work out" their design directly on the copper, with or without subject matter, but emphasizing the achieving of at least two or more textures.

When this is done, the copper can be nailed to the cover of the box, and the children can stain and shellac the whole box, including the foil.

Comments:

This activity is popular because:

- the project has utility and a certain stark beauty,
- the indenting into the copper stimulates kinesthetic responses,
- it has a tactile sensation that is pleasant,
- each process requires repetitive action and has a soothing effect.

BASKET WEAVING

for intermediate level pupils

Materials:
1/8" reed
pre-cut wood bases
a large pan of water (into which the reeds are dipped)
scissors

Motivation: Show a variety of completed baskets. Discuss their purpose - how they are used, and how their use conditions their shape.

Procedure: Demonstrate in brief form each step in basket construction:

-drilling the bases with holes into which the reeds are inserted,
-the soaking of the reeds to make them more flexible,
-the weaving and finishing operations.

Consult any reliable source for weaving instructions, since a description of the complete process is not possible here.

Comment: This project contains all the necessary criteria for maximum pupil involvement.

Each process is relatively simple.
-Skills are built by repetition, since each process must be repeated over again many times.
-Daily progress is clearly seen and can be measured by the child.
The completed project has utility and permanency.

INNER TUBE PRINTING

for intermediate level pupils

Material: discarded inner tube
cardboard
brayer
block printing ink
an old magazine (on which to roll out the ink)
cloth

Motivation: Talk about whether the students would like to make an apron, or perhaps a curtain for their own use. Follow up with a demonstration, showing how:

- the inner tube can be cut into interesting shapes,
- the shapes glued to cardboard,
- then inked with the roller ,
- and printed on a piece of paper or cloth in a variety of repeat patterns.

Procedure: Set up a table covered with newspaper, on which the blocks can be inked. The children can then experiment with the printing, learning the importance of adequate pressure and full inking. Afterwards they are ready to print a piece of cloth to be made into a utility article, such as an apron, smock, curtain, towel or handkerchief.

Comments: A few children may have trouble cutting the inner tube, using scissors. Otherwise, the operations are simple and the project is popular because:

- the skills are much more easily learned than in the traditional linoleum block type of printing experience,
- the child gets an immediate impression of how the spaces around the parts printed remain white,
- the printed areas leave greater clarity than in linoleum block printing,
- the final project can be completed successfully.

PAPIER MACHE ANIMALS

for intermediate level pupils

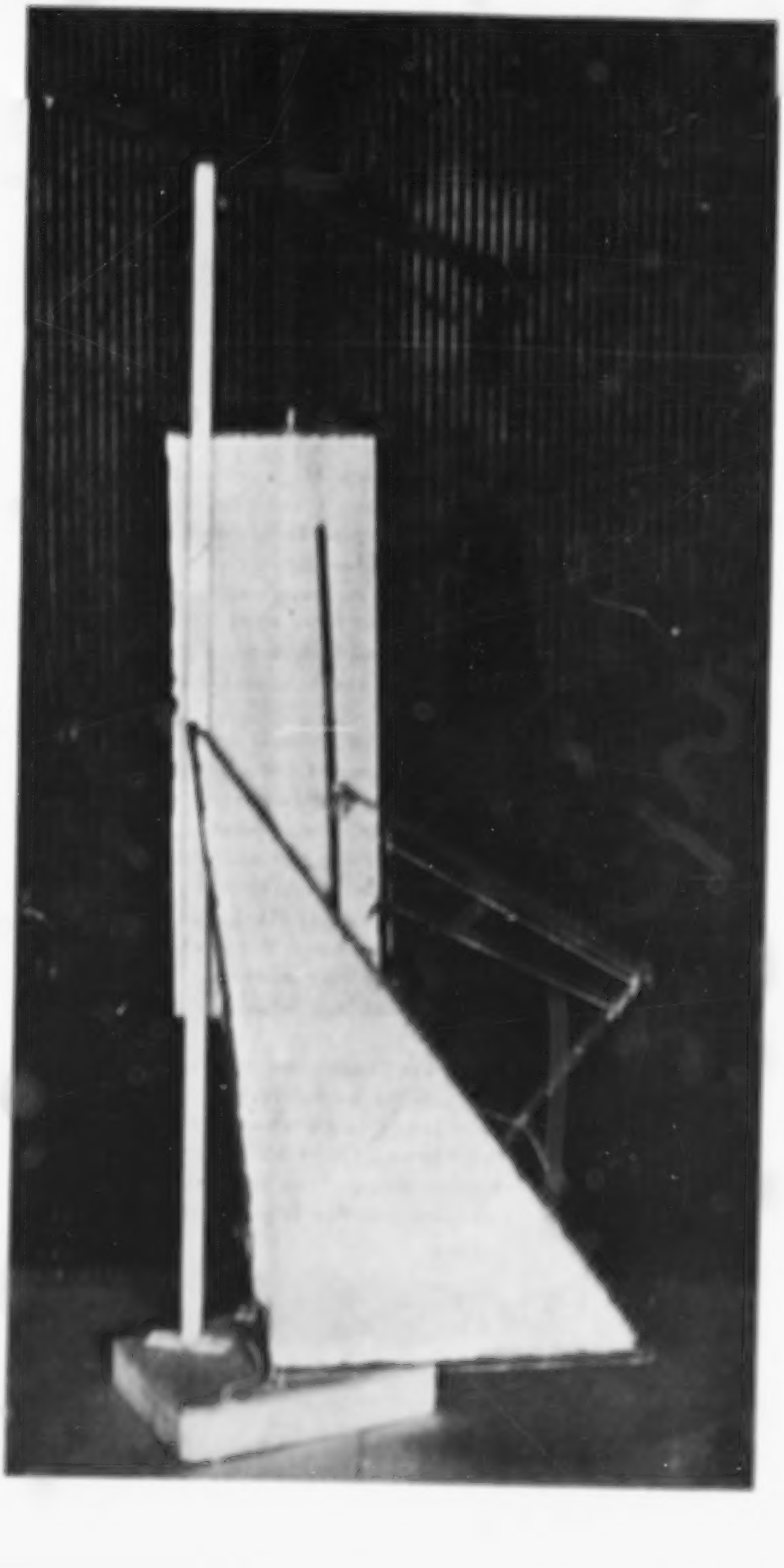
Materials:
newspaper
wheat paste
paste containers
paper toweling
string
tempera paint
brushes
colored paper and felt scraps

Motivation: Show several samples of previously made animals. Ask children how they think the animals were made. Encourage each student to choose his animal and try to visualize how he looks:

> Does he have long ears, short ears? What makes him what he is? (A rabbit's ears distinguish him; a cat's whiskers and tail make him cat-like, etc.)

Procedure: Demonstrate how the animal can be constructed by crumpling up newspaper into balls of various sizes, tying them together and covering with strips of newspaper dipped in wheat paste. After helping each child to construct his animal, show the class how the animal is then finished by covering him with a layer of paper toweling, pasted on, let to dry, and then painted and decorated with felt and colored paper, or other scraps, for ears, eyes, nose tongue, clothing, etc.

Comments: This is always a "take-home" project because it:
- -has utility as a toy,
- -is a tangible three-dimensional object to be viewed from all sides,
- -looks "pretty" to the child creator,
- -and stimulates imaginative play.



STABILE

for secondary level pupils

Materials: Balsa wood in strips and blocks
cardboard
wire
string
tissue paper
glue

Motivation: Show slides of space sculpture. If possible, also show actual samples of mobiles. Ask students why they think stabiles are even made. "What do they do to you?" If they do not "see" and feel the space in them, use this illustration: "Recall the last time you stood in a telephone booth. Do you remember that sense of relief you felt as you stepped out of the booth into a larger space? That feeling was a pure space reaction."

Procedure: Then encourage the students to "play" with the materials in front of them with the idea of both creating a construction which dramatizes space, and at the same time seeing that the construction has visual interest.

Comment: If the students can first be helped to experience a sense of increasing space by the way in which two planes are related to one another, they will be on their way to producing a successful stabile.

FOAM GLASS SCULPTURE

for secondary level pupils

Materials:
Foam glass
knives
spoons
files

Motivation: Display foam glass blocks. Ask them if they have ever experimented with new materials. "Did you enjoy it?" It certainly can be fun and a challenge to the artist.

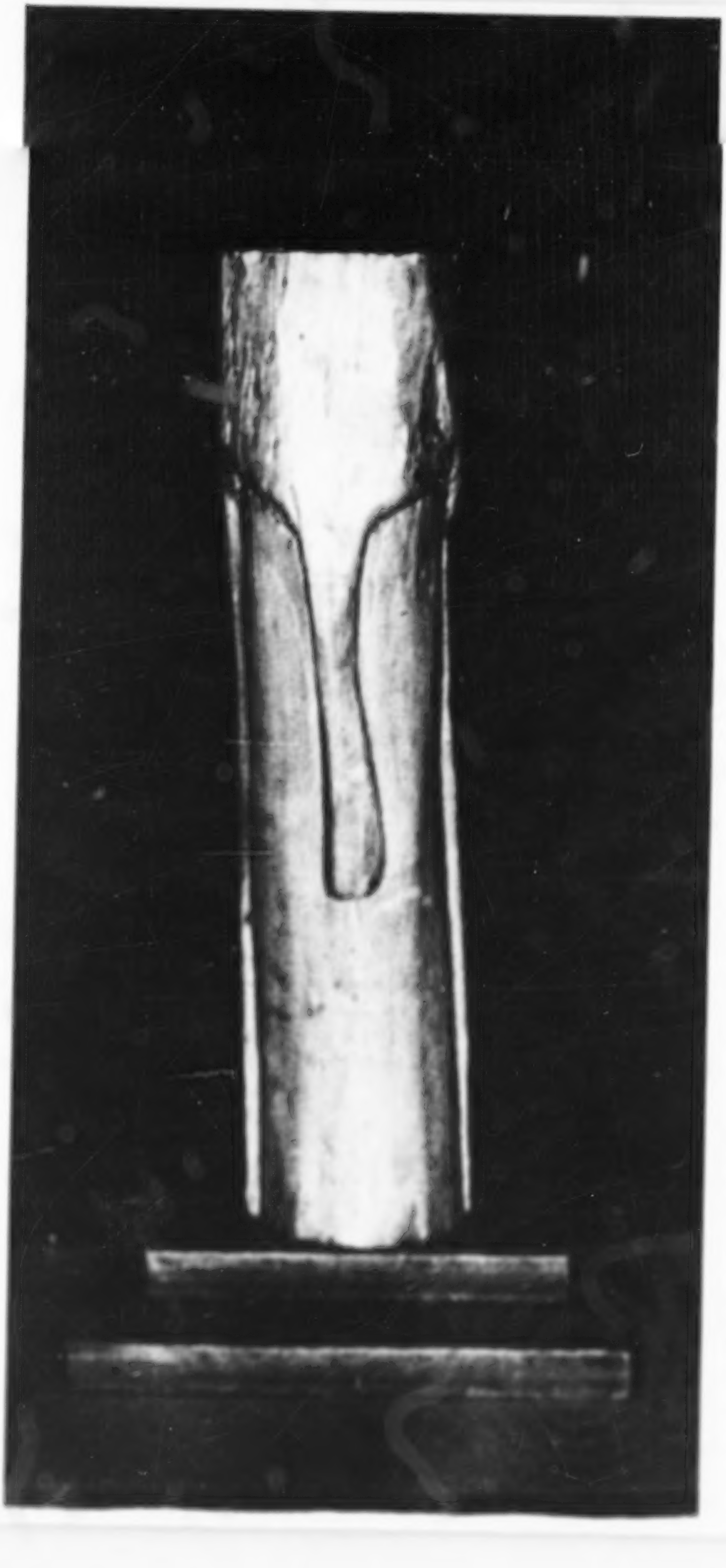
Procedure: Follow up with a brief demonstration, showing how the material can be scooped out with a spoon, carved with a knife, and filed if smooth curves are needed.

Again, as in the WOOD SCULPTURE project, emphasize that:

- the shape of our projected form should follow the shape of the whole block,
- we should not "make" the material do what cannot be done easily.

Comments: This project is often even more exciting to the student sculptor than carving in wood because:

- the problems of carving, spooning, and filing are new,
- the material shapes fairly easily,
- and the texture is dramatically different from clay or wood.



WOOD SCULPTURE

for secondary level pupils

Materials:

scrap wood blocks
pen knives
sandpaper
brushes
shellac
alcohol

Motivation: Hold up, in succession, several different wood blocks of varying shapes. Ask the students what they "see" in them. If some tend to see a small shape inside a large block, or a shape which does not generally follow the shape of the uncut block, then stress the general principle that "the shape of your finished piece should respect the character of the original block."

Procedure: Do not attempt to have the students draw the views of their subject on the four sides of the block. Rather, encourage them to work all around the block, cutting with their pen knife, and preserving the original shape of the block as much as possible.

After carving, the sculptures can be sanded, if desired, and shellacked.

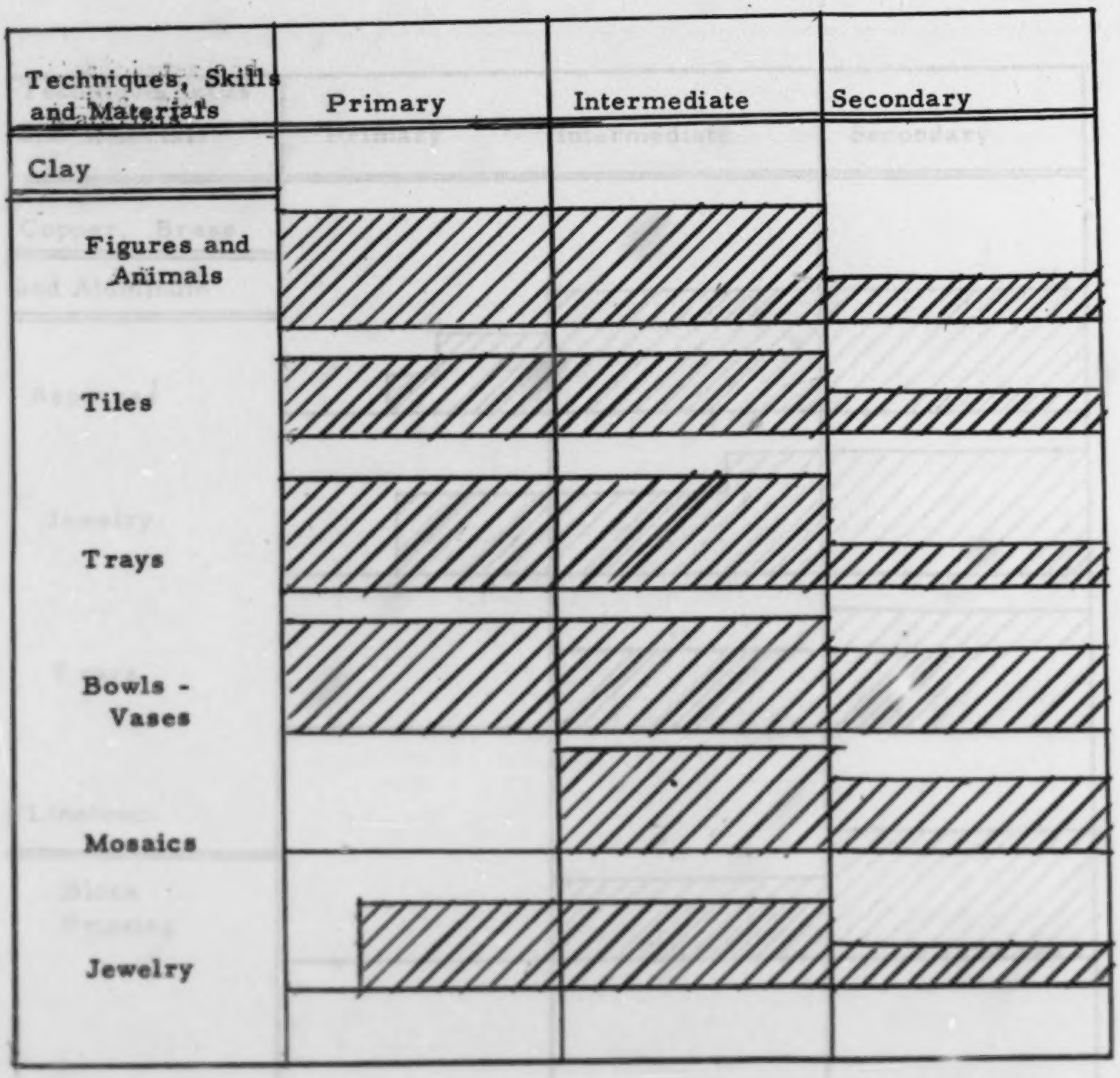
Comments: This activity remains popular because it:

- requires physical effort of a fairly strenuous nature,
- the daily progress can be clearly seen and measured,
- the resulting sculpture has a sense of permanence.

APPENDIX B

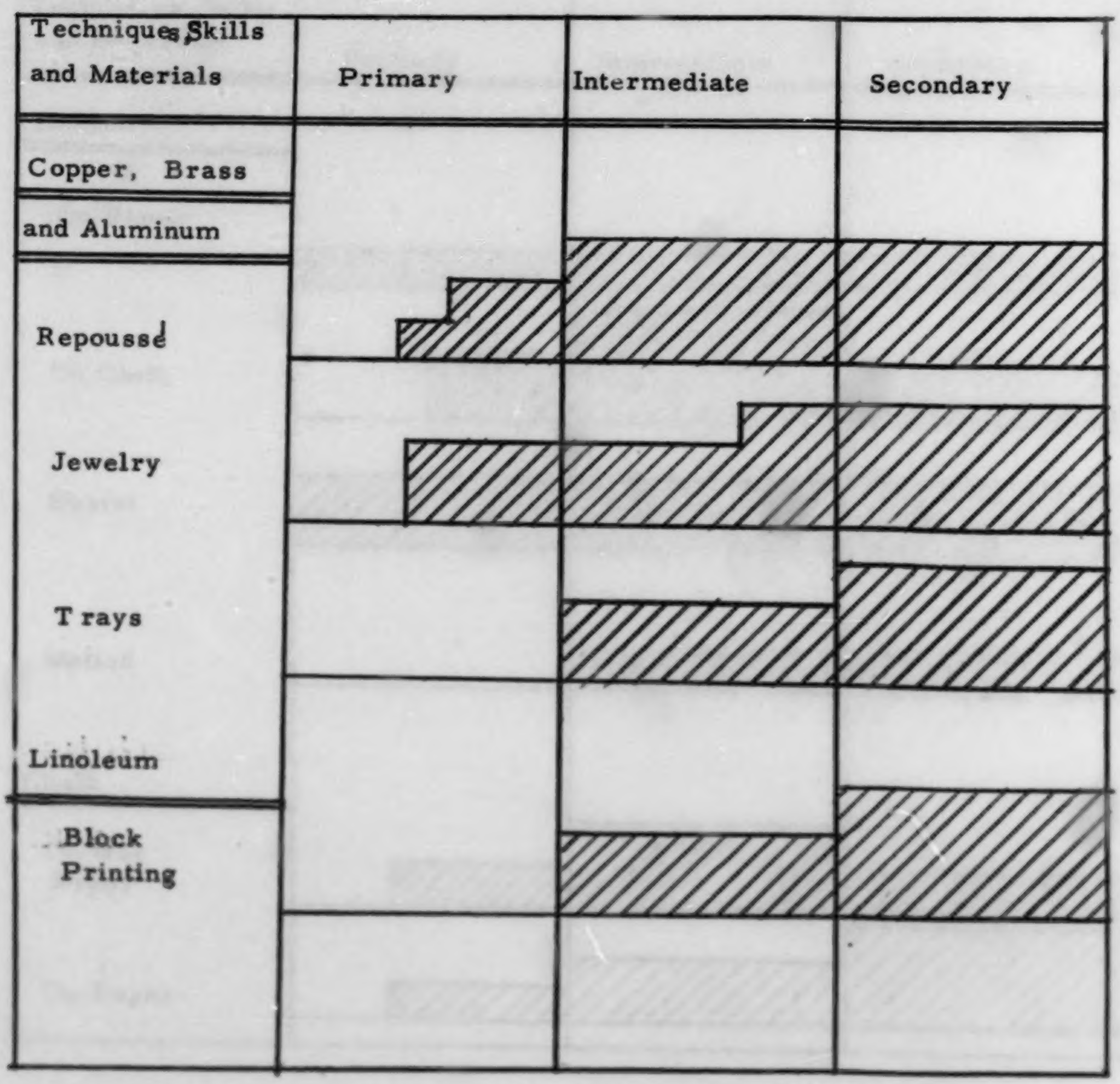
TECHNIQUES, SKILLS AND MATERIALS USED IN THE EXPERIMENTAL ART PROGRAM

These data were prepared as gross indicators for teacher use in selecting appropriate activities and do not purport to be refined statistical measures.



Length of bar = placement level.

Width of bar = relative degree of teacher preference for art activity.



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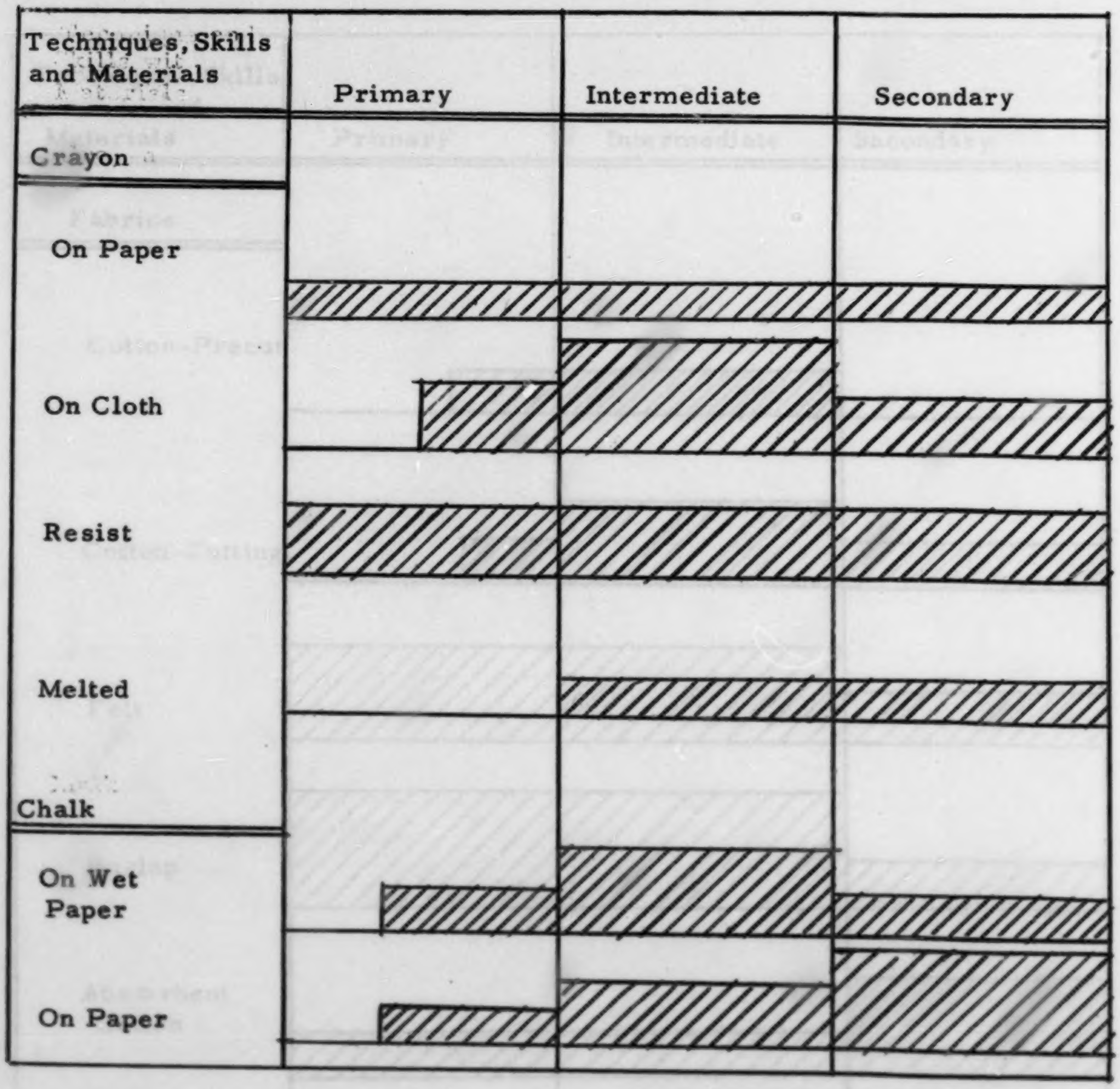

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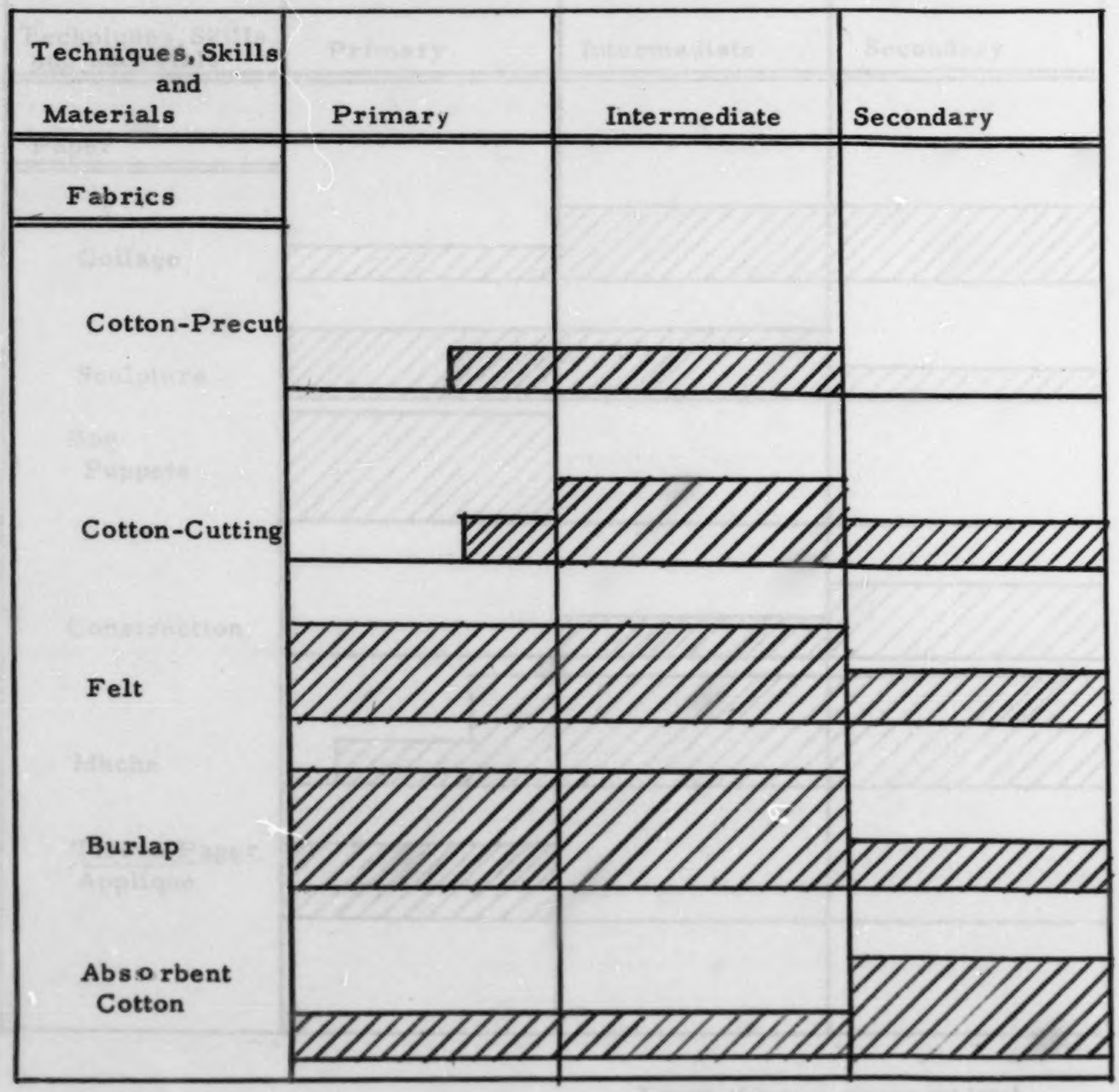

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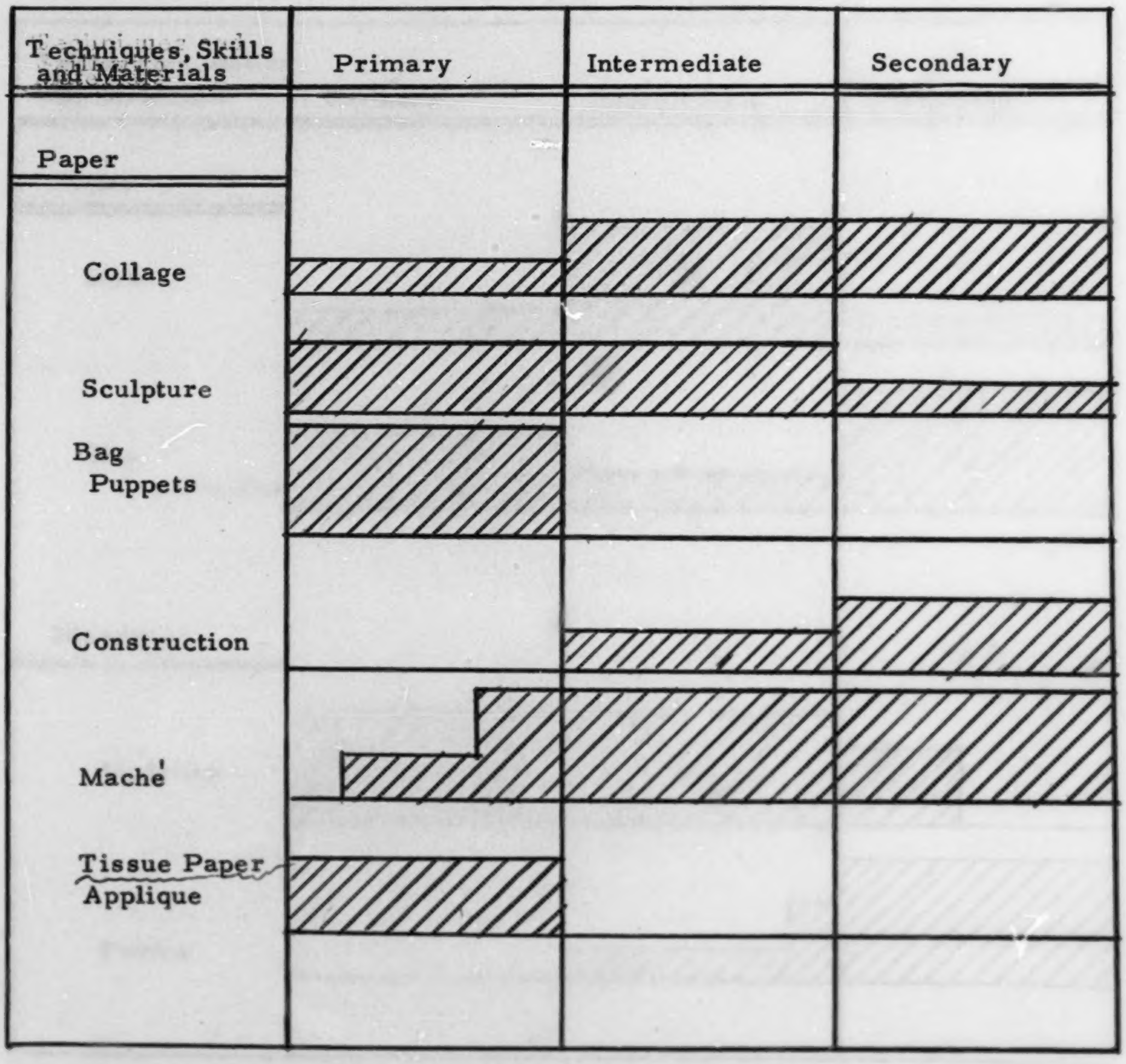

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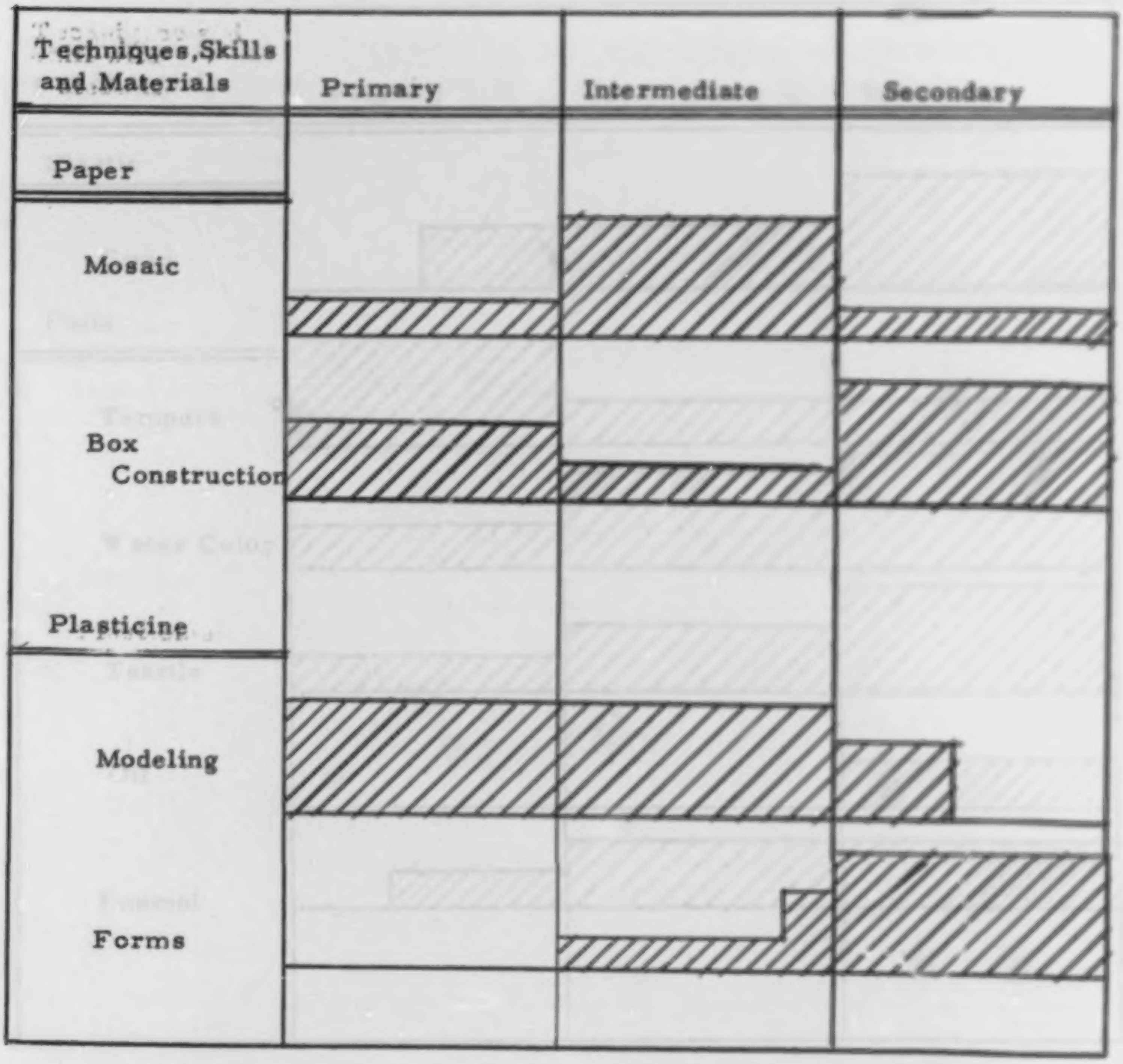

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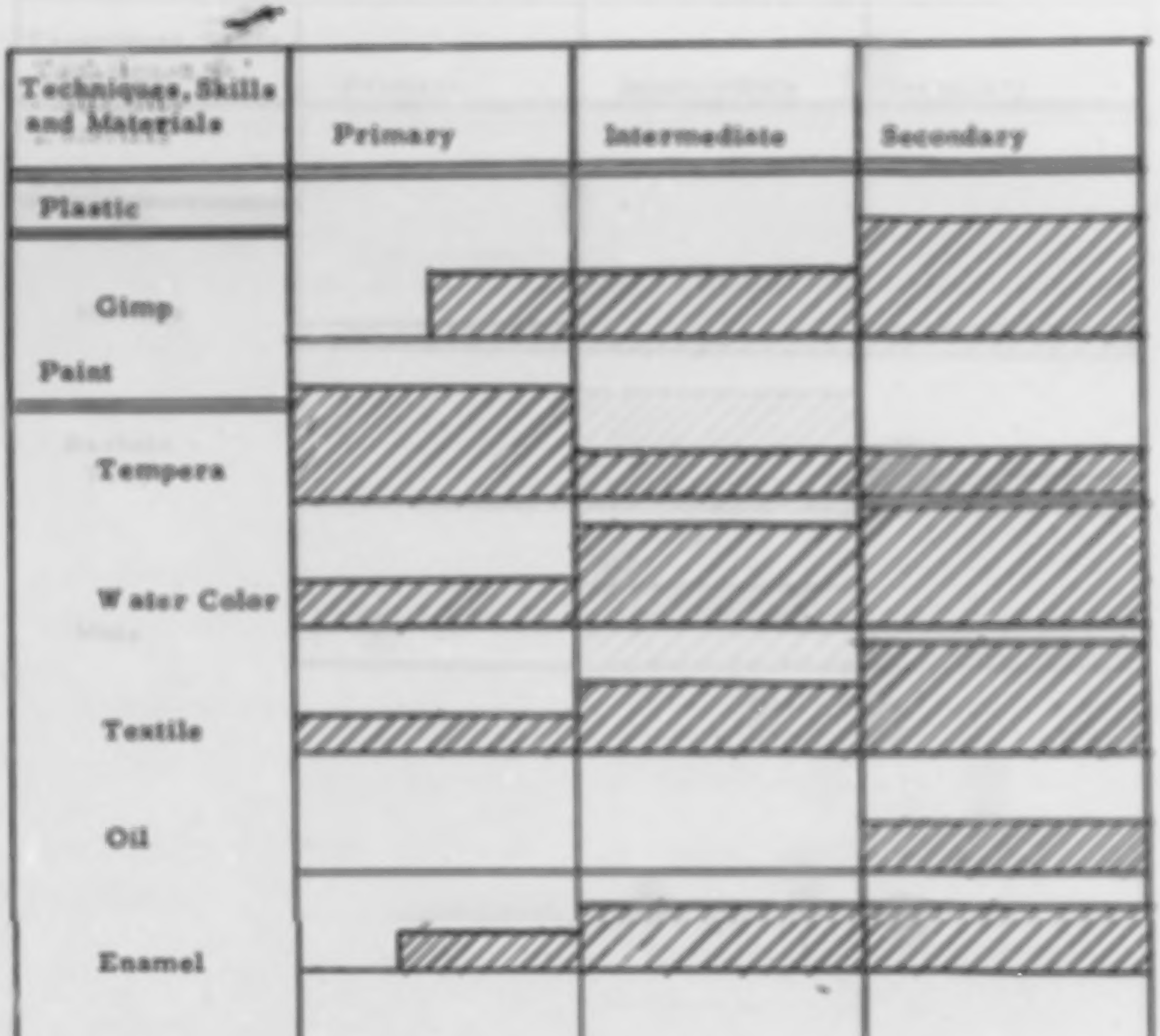

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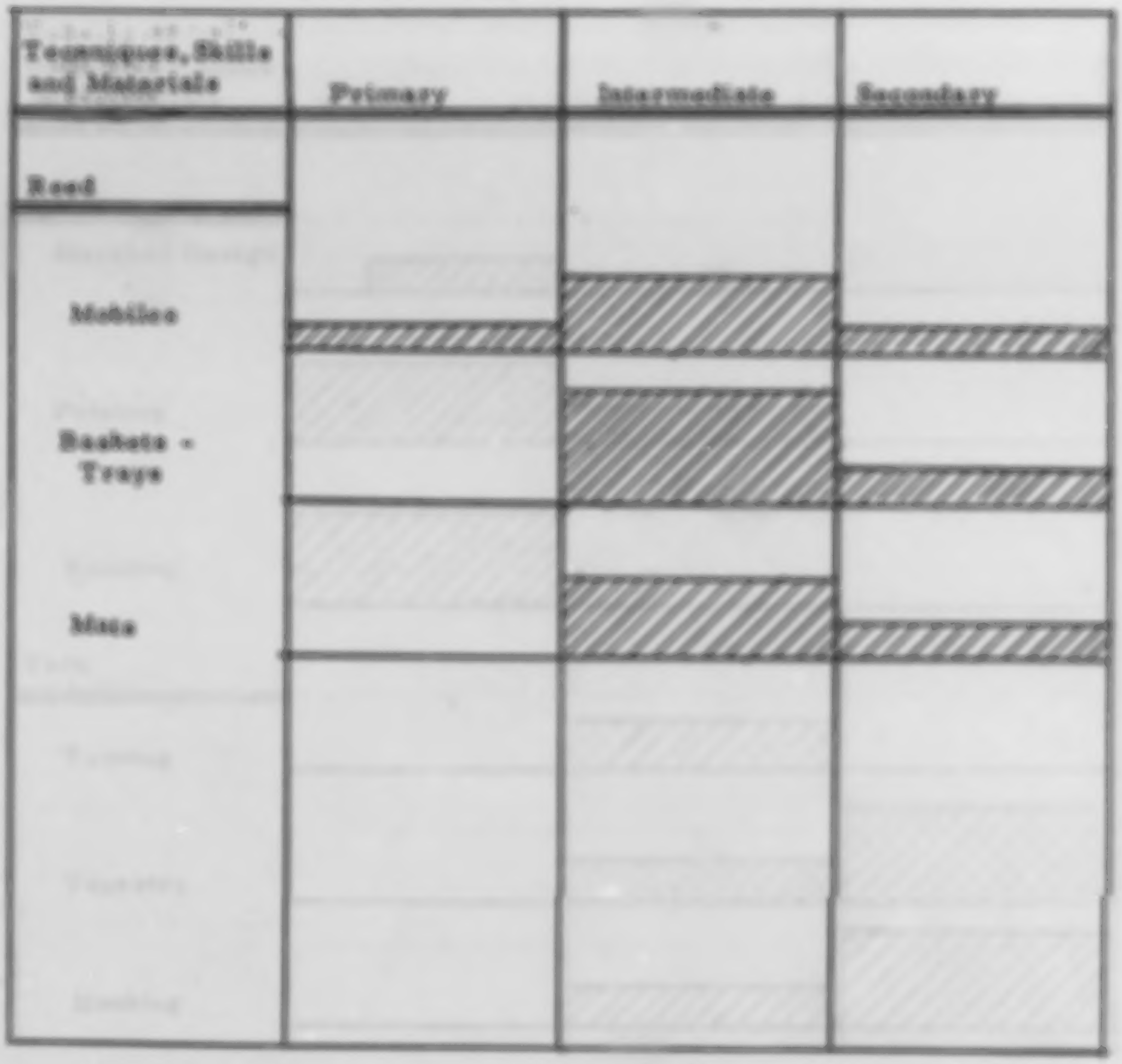

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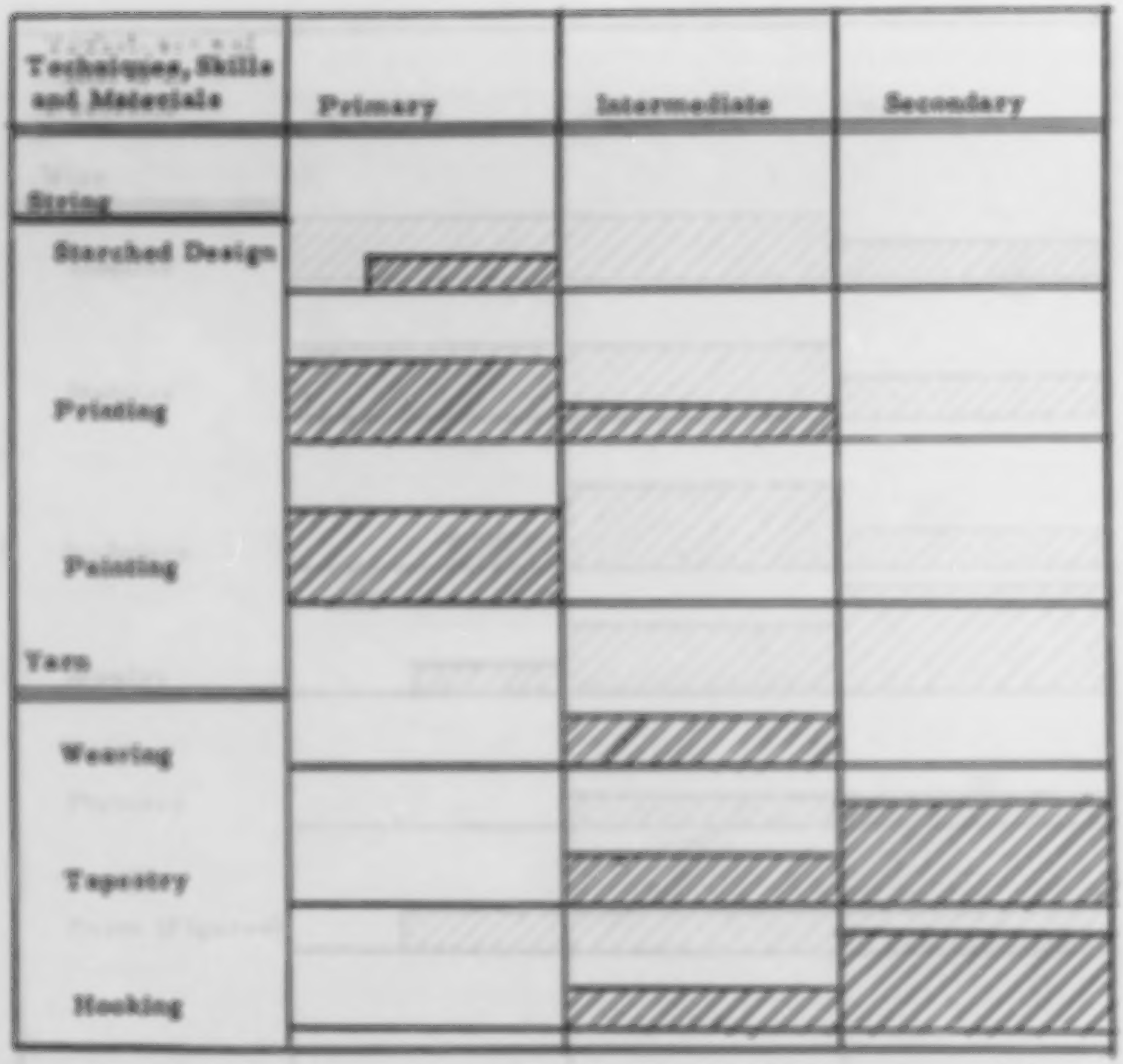

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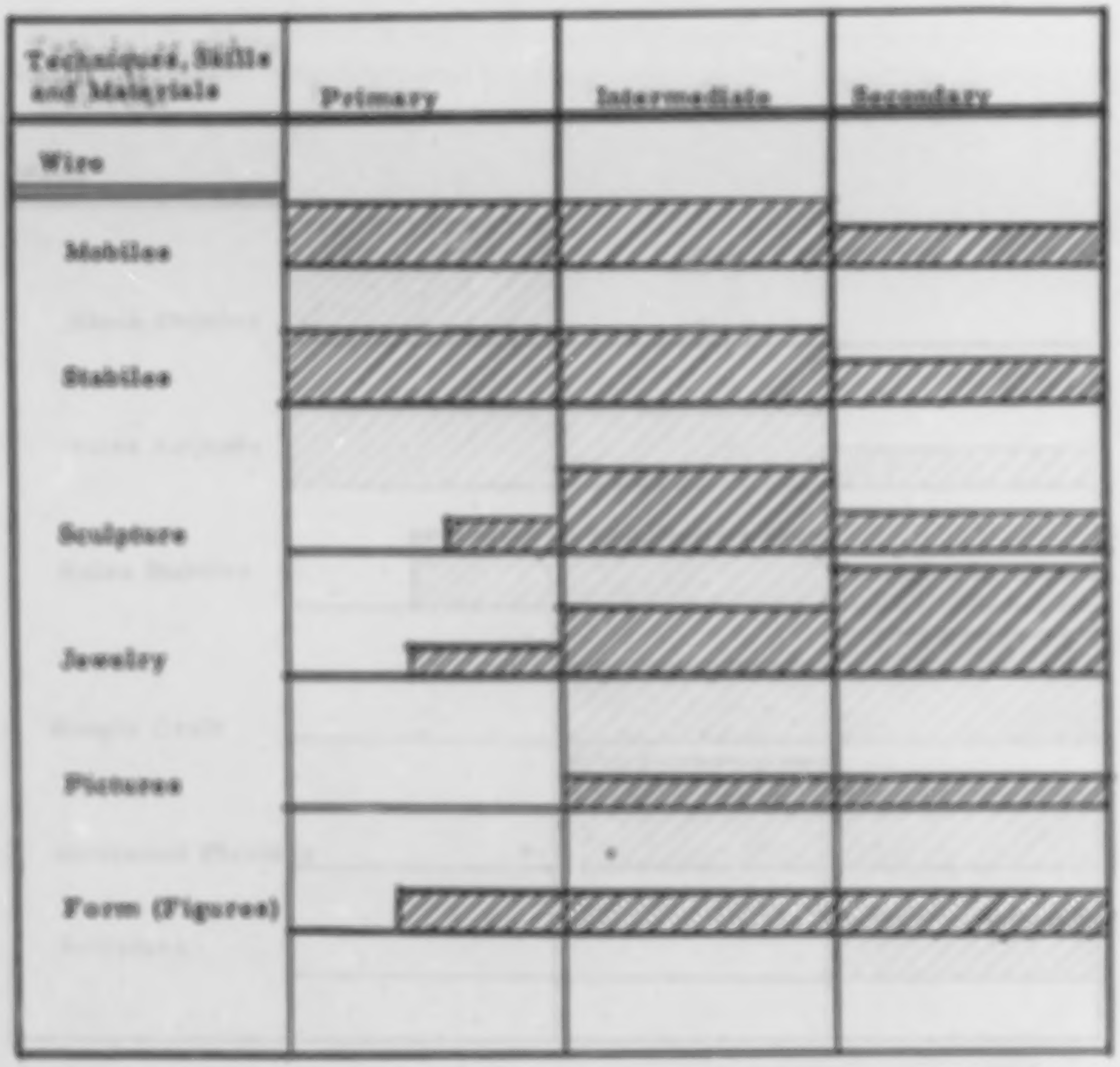

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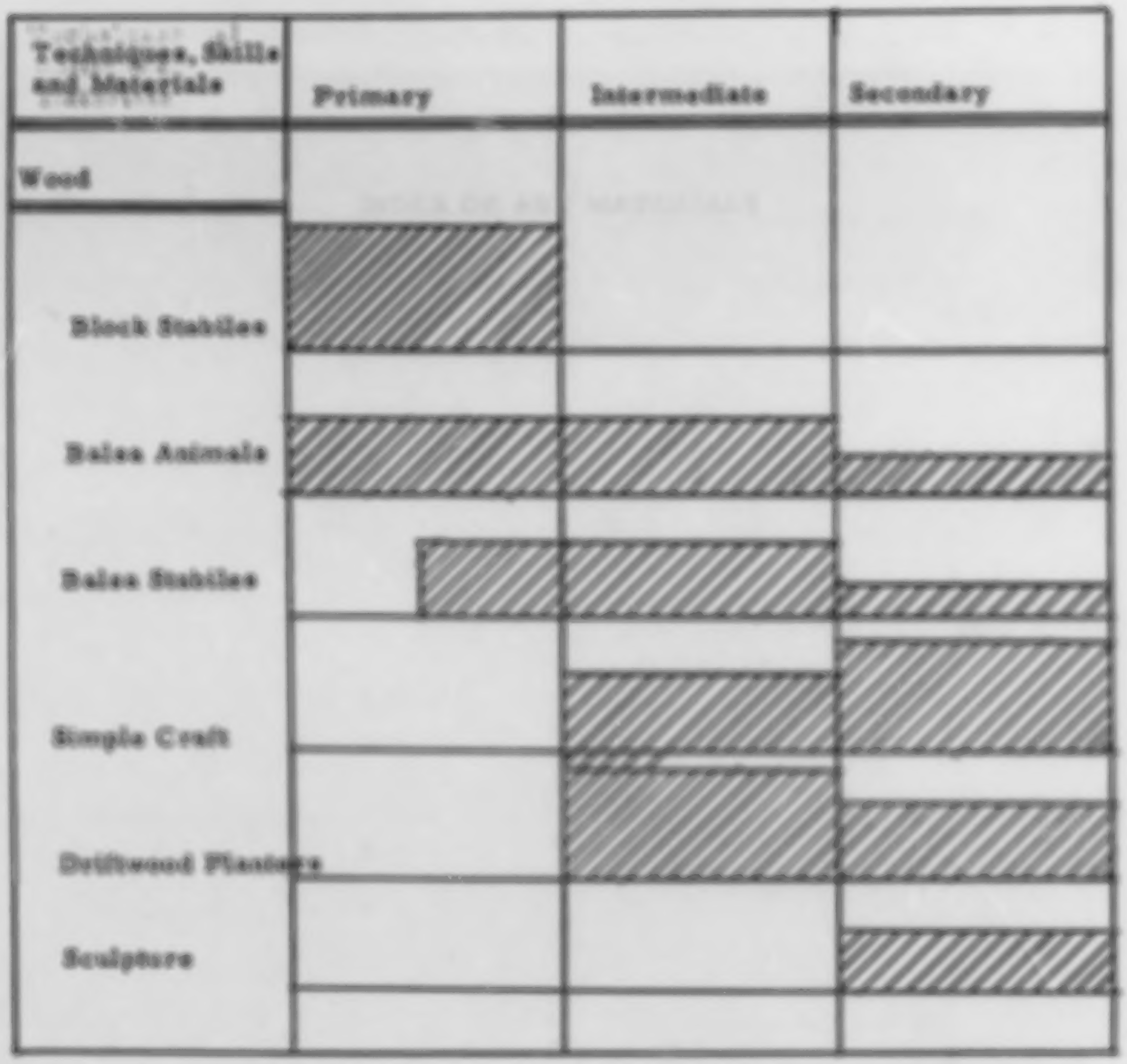

Length of bar = placement level.

Width of bar = relative degree of teacher preference for art activity.

APPENDIX C

Index of Art Materials Used by
[illegible] Students
Included in the Project Population

INDEX OF ART MATERIALS

A

Acid Resisting Paint

Adhesive, [illegible]

[illegible]

Aluminum Foil

Antique [illegible]

[illegible] Enamels

[illegible]

Awls, Scratch

B

Beads for [illegible]

[illegible]

Balsa Wood

Bases, [illegible]

[illegible]

Blades, Coping Saw

Blades, Jeweler's Saw

Blocks, [illegible] Linoleum

(B— continued)

Blocks, [illegible] Linoleum

Blocks, [illegible]

Board, [illegible]

Boards, [illegible]

Boards, [illegible]

Boxes, Cigar (Wood)

[illegible] Cutting Tools
(Linoleum)

Brown [illegible]

Brushes, [illegible]

Brushes, [illegible]

[illegible]

C

[illegible]

Casting Plaster

Chalk [illegible]

Charcoal Pencils

[illegible] (Special Charcoal
Pencils)

Index of Art Materials Used by Intellectually Handicapped Students Included in the Project Population

A

Acid Resisting Paint

Adhesive Ethylene Dichloride

Adjustable Jewelers Saw Frame

Aluminum Foil

Antique Glasses, assorted colors

Art Gum Erasers

Asphaltum Remover

Awls, Scratch

B

Backs for Earrings, Pins, Tie Clasps, Cuff Links

Barrettes

Balsa Wood

Bases, 3", Oriental

Belt Blanks

Blades, Coping Saw

Blades, Jewelers Saw

Blocks, Coated Linoleum

(B-- cont'd)

Blocks, Uncoated Linoleum

Blocks, Foamglass Flat

Board, Uncoated Cover

Boards, Masonite

Boards, Scratch

Boxes, Utility (Wood)

Boxwood Modeling Tools (6 shapes)

Brass Scraps, sheet

Brushes, Stencil

Buckles, Nickel

Burlap, natural & colors

C

Calf Remnants, Tooling

Casting Plaster

Chain Nose Pliers

Charcoal Pencils

Char-Kole (Special Charcoal Pencils)

(C -- cont'd)

Clasps, Tie

Clay, Body (Pasco Prepared)

Clay, Gesso

Clay, Mexican Pottery

Clay, Plasteline,
Chasselle Roman

Clay, Self Hardening,
Terra Cotta

Cleaner, Metal

Clothesline, Wire

Coated Linoleum Blocks

Coping Saw Blades

Copper Foil

Copper Sheets and Scraps

Copper Shapes, Pre-formed

Copper Wire, 22 gauge, square

Cork

Corrugated Paper, Assorted Colors

Cover Board, Uncoated

Crackle Glaze (Pasco Clear)

Crayons

E

Earring Backs

Enamel - Formula 7001

Enamel, Metal (Assorted Colors)

Enameling -Transparent Lumps

Erasers, Art Gum

Escutcheon Pins, Copper

Ethylene Dichloride Adhesive

F

File Set, Needle

Finger Paints, Assorted Colors

Foamglass Flat Blocks

Foil, Aluminum

Foil, Copper

Formula 7001 (Enamel)

Frame, Adjustable Jewelers Saw

G

Glazes, Assorted Colors

Glazes, Pasco Clear Crackle

Glazes, Pasco Antique,
Assorted Colors

Glue, LePage's White

Goat Lacing

I

Iron Binding Wire

J

Jewelers Saw Blades

Jewelers Saw Frames,
Adjustable

K

Keepers, Metal
(for belts and straps)

L

Lace, Solid Plastic Flat

Lacing, Goat

Lanyard Snaps

LePage's White Glue

Linoleum Blocks, Coated

Linoleum Blocks, Uncoated

Lump Enamel, Unground,
Transparent

M

Masking Tape

Metal Cleaner

Metal Enamel, Assorted Colors

Mexican Pottery Clay

(M--cont'd)

Modeling tools, Boxwood (shapes)

Muslin

N

Needles, Crewel

Needles, Darning

Needles, Hooked Rug

Needles, Tapestry

Needle File Set

Newspapers (old)

O

Oriental Bases, 3"

P

Paint, Acid Resisting

Paints, Finger,
Assorted Colors

Paper, Charcoal

Paper, Corrugated,
Assorted Colors

Paper, Stencil

Pasco Antique Glazes,
Assorted Colors

Pasco Prepared Clay Body

(P--cont'd)

Paste, Wheat

Pastels, Sargent School

Pencils, Charcoal

Pin Backs

Pins, Escutcheon

Plasteline, Chaselle Roman, Clay

Plastic Remnants

Plaster, Casting

Pliers, Chain Nose

Pottery Clay, Mexican

-R

Raffia, Assorted Colors

Reed, Round and Flat

Remnants, Tooling Calf

Remover, Asphaltum

Rings (Men's and Ladies')

Rug Yarn, Heavy,
Assorted Colors

S

Sandpaper, Assorted

Saw Blades, Coping

Saw Blades, Jewelers

(S--cont'd)

Saw Frame, Adjustable
Jewelers

Scratch Awls

Scratch Boards

Self Hardening Clay,
Terra Cotta

Sheet Copper

Snaps, Lanyard

Soap (Tide)

Solder, Solid Wire

Sponges

Steel Wool Pads

Stencil Brushes

Stencil Paper

T

Tape, Masking

Threads, Assorted

Tide (Soap)

Tie Clasps

Tooling Calf Remnants

Tools, Boxwood Modeling
(6 Shapes)

Transparent Lumps
(Unground Enamel)

U

Uncoated Cover Board

Uncoated Linoleum Blocks

Underglaze (Pasgobes), Assorted Colors

Utility Boxes, Wood

W

Warp, Ready Spools (Weaving)

Wheat Paste

Wire Clothesline

Wire, Covered Spool

Wire, Copper

Wire, Iron Binding

Wire Solder, Solid

Wood

Y

Yarn, Assorted Colors
(for Stitching)

Yarn, Rug, Assorted Colors

Z

Zonalite

APPENDIX D

COPIES OF NON-STANDARDIZED TESTS USED IN THE ART PROJECT

Proposed Rating Schedule for Classes of Exceptional Children*

1. Child's ability to stay with group activities and remain integral to them.

Impervious to group.	Hardly knows others are near.	See others but is indifferent to them.	Some response to others on occasion.	Takes others into consideration when he wants to.	Usually takes one or many others into regard.	Amenable to and ready to consider others at any time.

2. Child's ability to concentrate on and finish (follow-through on) tasks given him.

Extremely flighty.	Flighty most of the time.	May or may not stay with task; not dependable.	Stays with task if supervised some.	Can stay with task on own to some extent.	Stays with tasks very well even against will.	Fine ability to concentrate and stick with requirements.

3. Child's ability to get along with peers.

Fights, or in conflict almost all the time.	In conflict often or most of the time.	Usually has too much conflict for his and others' welfare.	Conflicts coming under some control.	Makes an effort to control discord.	Gets along well nearly all the time; controls self well.	Little or no conflict at all; under good self-control.

4. Child's ability to share materials and equipment with others.

Wants all for himself always or nearly always.	Is hard to get him to share.	Shares only if cautioned in advance.	Shares in some ways or at some times.	Usually shares well.	Can be depended upon to share in nearly all instances.	Shares and takes responsibility for others readily and always.

5. Child's ability to change to new activity under guidance or direction.

Won't change except under strong pressure.	Usually very reluctant to change; opposes it.	May or may not change; depends on "whim".	Changes with some effort; not willing.	Changes slowly but with some willingness.	Changes reasonably well and willingly in most cases.	Changes and complies well in all or nearly all instances.

6. Child's ability to face own failures and shortcomings.

A very bad loser; always makes excuses.	Usually a bad loser and excuse maker.	Loses badly now and then; may face it well sometimes.	Usually a fairly good loser.	Faces losses and shortcomings on most occasions.	A real good loser; faces shortcomings well.	Excellent loser and not indifferently, seeks correction of weaknesses.

7. Child's willingness to abide by general rules.

Breaks rules right and left.	Generally breaks rules.	Breaks rules and follows them in seemingly random ways.	Abides by rules if held up to him.	Can be depended upon in many ways to follow rules.	Generally follows rules well.	Excellent; very dependable and willing.

8. Child's restraint from show-off behavior.

Shows off all the time.	A big showoff usually.	Shows off and is restrained in random ways.	Avoids show off behavior on some occasions.	Usually controls self pretty well.	Shows good control most of the time.	Always unde healthy self-control.

9. Demonstrates self-confidence.

Utterly lacking.	Lacks it most of the time.	Shows it now and then; lacks it at random times.	Shows self-confidence in some ways.	Shows self-confidence in many ways.	Comfortably confident in most ways.	Very confident without bravado in all situation

10. Child's dependency on teacher for help/attention.

Always seeks help or attention.	Often seeks one or both.	Seeks both in random ways.	Able to get along on own on some occasions.	Gets along on own much of the time.	Very resourceful; usually on own.	Very independent and resourceful.

* Categories used here represent portions of the scale adapted for use in this study.

Art Interest Inventory

E ______

C ______

1. I attend ______________________________ School.
   Name of School

2. I have ______________________________ teachers.
   How many?

3. I like best the teacher of my ____________ class.

4. I like next best the teacher of my ____________ class.

5. I like least the teacher of my ____________ class.

Art Evaluation Conference (Pupil-Teacher) **COOPERATIVE RESEARCH PROJECT**

Name of Pupil or Identification No. Date Art Project No.

Teacher Length of time to complete article

EVALUATION

To make this apply specifically to the pupil's own art experience, insert the word vase, picture or tray when asking the question.

I. Did you choose to make this ____________ because
- it looks pretty?
- it can be used?
- you liked the feel of the material?

II. From making this ___________ did you learn
- to use a new material?
- to use a new tool?
- to make a more finished product?
- another skill?

III. Did you choose this color because ________
- it is a bright color?
- it is a dark color?
- you like using many colors?
- other reasons?

IV. Do you plan to use this__________
- as a gift?
- to wear?
- to decorate the school?
- to decorate your room at home?
- other use?

V. Did you enjoy most __________
- getting ready to work (planning)?
- experimenting with the material?
- using the tools?
- having a finished object to show?

VI. If you made another _________ would you
- make it smaller?
- make it larger?
- make additional parts?
- make other changes?

Sketch of article here	Photograph of finished article here

MOTOR COORDINATION APPRAISAL

OBSERVATION OF PUPILS MOTOR COORDINATION IN LIFE SITUATIONS

Rate numerically:
0 = Total Inability
1 = Less than Normal Ability
2 = Normal Ability
3 = Better than Normal Ability

	Pre-Evaluation				Final-Evaluation			
	0	1	2	3	0	1	2	3
I. Walking								
II. Eating								
III. Dressing (Such as Lacing Shoes Buttoning Jacket & Zip Zipper)								
IV. Manuscript printing								
V. Cursive writing								
VI. Running & Jumping								
VII. Throwing ball & Catching ball								
VIII. Operation of Typewriter								
IX. Operation of Sewing Machine								
X. Operation of Jig-saw								
XI. Operation of Electric Iron								
XII. Bicycle Riding								
XIII. Calisthenics or Rhythmic motions								
XIV. Rhythms to Music								
XV. Square Dancing								
XVI. Ballroom Dancing								
XVII. Tap Dancing								
XVIII. Ballet								

Name of Pupil__________ Observer: Art Teacher______ S.E. Teacher____
Nurse________ P.E. Instructor______

COOPERATIVE RESEARCH PROJECT
U. S. Office of Education
University of Maryland
Arlington County Public Schools

PARENT INTERVIEW QUESTIONNAIRE

Recommended procedure for interviewing the parents of students in the cooperative research study.

INSTRUCTIONS FOR THE TEACHER

During the parent-teacher interview elicit the following information either from a general discussion of the student's school program or by the following direct questions:

> **"As you may know, your child is engaged in a varied program of classroom activities. We would like to know how he feels about the different subjects in his program."**

1. **Has he said anything about his schedule of classes?**

2. **What subjects has he referred to with a favorable comment?**

3. **What subjects reflected an unfavorable attitude?**

4. **Did he give any reasons for the particular reactions stated above?**

Characteristics of the Teaching Process

1. During the art experience the students' sense of security appeared to be _________ decreasing ______ constant __________ increasing.

2. Sample finished products were shown _____ before _____ during ______ after the lesson.

3. Directions for carrying out processes were given _______ before starting _______ preceding each step ______ repeated ____________ times.
how many

4. Growth in the art objects was seen _______ daily ______ after a week's work __________ spasmodically.

5. Students were free to move about in ______ their own work area _______ the art room ________ the building.

6. Art activity required ________ one choice _______ several single choices ________ problem solving (planning).

7. Evaluation of the pupil's work involved _________ directed questioning ________ pupil-teacher discussion _______ total group discussion.

8. Tools and materials were cared for by ______ each pupil _____ a committee ________ the teacher.

Note: More than one answer may be checked if applicable.

Activity # ______

Type of Art Experience:
Materials Used:
Motivation:
Evaluation:

1. Number of students who completed the project satisfactorily _______
2. Number of students who did not complete the project ____________

What difficulties were encountered? Describe briefly.

Teacher___________
Date ____________

ART BEHAVIOR RATING SCALE

For use in all exceptional children's classes involved in the University of Maryland Study --- By Richard G. Wiggin

1. CONCENTRATION: Child's Ability to Concentrate on Art Task

Completely distracted by other stimuli	May or may not stay with task; not dependable	Stays with task if supervised some	Stays with task almost all the time	Sticks relentlessly to task until completely finished

2. ANIMATION: Child's Tendency to Become Excited and Pleased by Art Task

Completely disinterested	Shows mild interest but still not very enthusiastic	Shows fair interest and works reasonably intensely	Shows good degree of interest and excitement	Is excited by art task and highly animated

3. DESIRE TO COMPLETE: Child's Expressed Desire to Complete the Art Task

Never completes anything	Rarely interested in completing task	Completes some of tasks, some not.	Usually completes what he starts	Always completes every task

4. WHAT HE WANTS TO DO WITH IT: Child's Verbalizing of Use He Will Make of Art Object

Never says what he will do with it	Rarely says what he will do with it	Sometimes says what he will do with it, sometimes not	Usually tells how he will use it	Always says how he wants to use it

5. ENJOYMENT: Evidence That the Child Really Enjoys the Art Task

Activity shows disgust	Rarely enjoys what he does	Sometimes appears to enjoy the task and sometimes not	Almost always shows genuine enjoyment	Always intensely pleased by art task

6. PRIDE: Child's Tendency to be Proud of What He Has Made

Reacts negatively to praise	Rarely cares whether teacher praises or not	Sometimes asks for praise and seems pleased when it is given	Often asks for praise and enjoys receiving it	Always eager for praise and is genuinely proud of what he has done